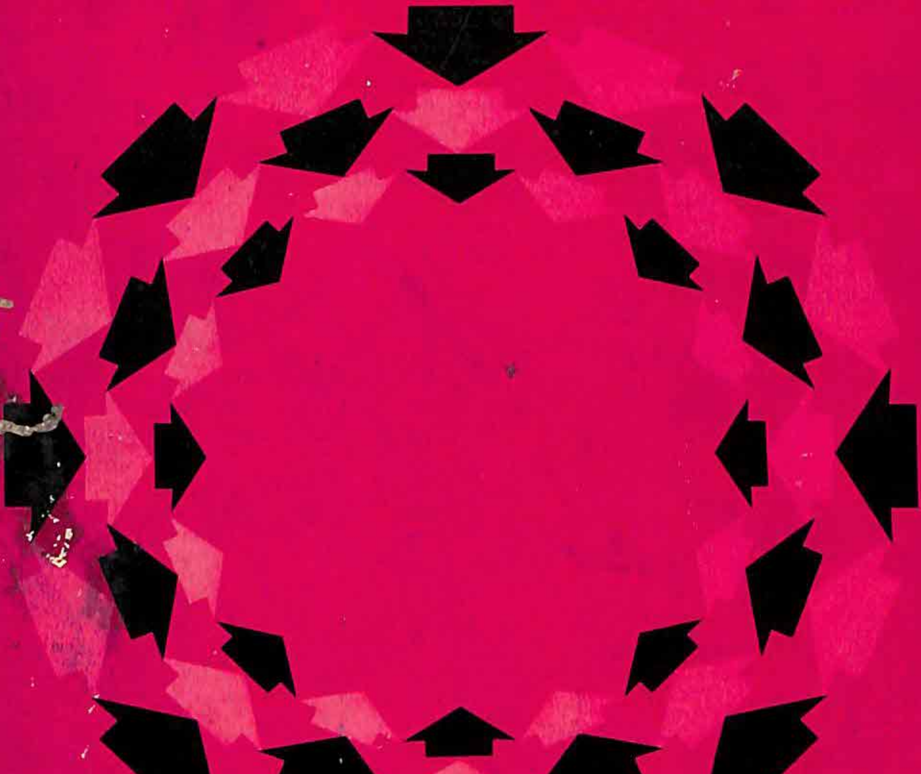
Principles and Practice of Education



Teacher Education in Africa

R. CHAPMAN-TAYLOR

7/5
FDU.

~~1864~~
~~4928~~

STATE INSTITUTE OF EDUCATION
B

3103

PRINCIPLES AND PRACTICE OF EDUCATION

TEACHER EDUCATION IN AFRICA

General Editor: Professor A. Taylor

18b,

Principles and Practice of Education

3/03

R. CHAPMAN-TAYLOR

Senior Lecturer with special responsibility for relations with Teacher Training Colleges, Institute of Education, Ibadan University

STATE INSTITUTE OF EDUCATION
BANIPUR

S.C.E.R.T., West Bengal
Library
Calcutta
25/3, B. C. Road

COLLINS London and Glasgow

First edition, 1966
© R. Chapman-Taylor, 1966

S.C.E.R.T., West Bengal
Date 12.2.85
Acc. No. ~~30~~ 3103

3103

370.1
CHA

*Printed in Great Britain at the Press of
the Publishers, Cathedral Street, Glasgow*

General Foreword

The development of educational systems capable of meeting the ever-increasing demands of the modern world is a major task facing governments today. Key institutions in meeting this problem are the Teachers Colleges. For it is through their products—the teachers—working in the classroom that the effectiveness of educational planning and provision is ultimately determined.

To help meet the needs of student teachers who are being prepared for work in the Primary and junior forms of the Secondary Schools in Teachers Colleges in Africa this series has been evolved. It is designed to give the information and guidance needed on current trends in education and to give the student the necessary professional basis to meet modern educational requirements. *Principles and Practice of Education* is the first of the series which will cover the Foundations of Education, Curriculum Studies, and Educational Administration. The aim is to achieve, by African data and authors currently working in Africa, an integration with African problems that has not always been hitherto possible.

A. TAYLOR

Acknowledgments

The ideas and examples in this book have been collected during many years of talking and reading, teaching and inspecting, and though few, if any, are of my own begetting, I take responsibility for them by adoption. In putting them into their present form I gratefully acknowledge the many suggestions and constructive criticisms of my old colleague, Harold Clark, officer for in-service training for the New Zealand Department of Education, and also the help of tutors from more than fifty Nigerian Teacher Training Colleges who, with many of their students, read and reported on the chapters as they were written.

R. C.-T.

~~1864~~

Contents

Introductory Remarks 9

1. *Nature and Aims of Education* 11
Education is helping children to grow up—The control of education—Who controls the state?—Character and personality—The aims of children—The effect of change—Summary

2. *Natural Learning* 20
Children and individuals—The basic processes of learning—Learning begins with activity and experience—Learning to use the senses—Learning to think—Learning to communicate—Learning to talk—Developing general ideas or concepts—Conditions for learning—Children set their own goals—Children use other languages—What children have learned before school

3. *Motivation* 36
Why do children learn?—Basic needs

4. *Principles of Teaching* 50
1. Respect for each child—2. Activity and experience—3. Value, purpose and point—4. and 5. Individual learning and shared learning—6. Teaching should proceed in an educationally logical order—7. Evaluation

5. *Planning the School Curriculum* 87
1. The aims—2. The programme of school work—3. The grounds, buildings and equipment—4. The management of children—5. The school and the community

6. *Class Teaching* 111
Social studies: history and geography—Language—Arithmetic—Science in primary schools—The arts

A Final Word 189

Introductory Remarks

This book has been written to help young primary school teachers to think about their work and to make up their minds how to go about it. Education is not one of the subjects on which any great authority is able to say the final word while the rest of us drink in his wisdom. On this subject the most experienced have their doubts. Education is one of the most argued about subjects in the world for two main reasons. The first is that its results are so important and therefore everyone wants its direction to be correct and its practice to be effective. The second is that it deals with the most varied and complicated and difficult-to-understand material that exists: human beings.

Everyone accepts that modern machinery requires expert handling and that only the carefully trained person can understand it, but even the most intricate electronic machines are simple compared with human beings. The study of human beings has been going on for a long time and a great deal has been learned. But when we think of the complication of the material of study we must admit that we are just at the beginning.

For these reasons I must warn you at the outset that you will seldom be able to get neat and certain answers to the questions you may ask about the nature of children, about how they learn and what is the best way to teach them.

You are sure to get several answers to almost any question, and often opinions, or part answers, rather than simple factual answers. In practice you will have to make up your own mind about how you will teach, you will have to evaluate and criticise your own methods, you will have to make your own adjustments to the situations in which you work.

There is only one good reason for using a method of teaching and that is that it is the most effective one in the circumstances. This sounds simple, but in education nothing is simple. What do we mean by effective? Do we mean effective for the moment, or effective for a lifetime? Do we mean effective for one small item of learning, or do we consider the effect on children's attitudes to learning in general? And what do we mean by circumstances? Do we refer to the classroom conditions, the kind of teacher, the climate, the kind of children, or all of these? And how do we estimate the effect of a method on what children will be in five years' time? You can see that in choosing methods we have to be sensible and take everything into consideration.

We must be adventurous, too, prepared occasionally to try something new and to keep on trying for some time before we evaluate the results, for without adventure and experiment we can never make progress. But in the end we must make a judgement, an evaluation, for it is no use continuing with methods that fail. We have to beware of those who, on finding their methods fail, advise that more of the same method is the answer. If flogging a child frequently for years has failed to make him like school work or behave well, it is no use saying that what he needs is a good flogging.

In the following pages you will find ideas and questions to think about, some orthodox, some, perhaps, a little unusual. They are not there to be accepted, learned, and served up at the examination. They are there for you to think about, to argue about, and to use as a basis for practice while you are forming your own ideas on education and your own style of teaching.

You will meet many other ideas on education and plenty of conflicting advice on how to teach. Is there, you may ask, no principle on which you may make your choice? There are in fact several. You may ask: Is this the simplest and most natural way to achieve my aim? You may ask: Would I like to be taught that way? You may ask: Do I know any better way to achieve my aims? You *must* ask: Can this method achieve my long-range aims as well as my immediate aims?

And if you find the same answer to each of several methods, then you must ask: Which of these do I find most enjoyable? For any effective method that you enjoy is likely to be enjoyed by your pupils, and pupils ought to enjoy their education.

CHAPTER ONE

Nature and Aims of Education

What is education, who carries it on, and what do we hope to achieve by it?

EDUCATION IS HELPING CHILDREN TO GROW UP

To most parents it seems obvious enough that education is what goes on at school. It is carried on by teachers, and the purpose is to learn to read and write and do sums. Teachers, however, know that they expect the parents to share in the responsibility for school work by providing books, seeing that the children do their homework, and sending them to school on time, as well as by preparing them to come to school by teaching them to speak, to keep clean, and to behave properly. Parents also expect teachers to see that their children behave properly, keep clean, and are looked after if they are sick.

Evidently teachers and parents share the responsibility and the work of bringing up children and educating them and there is no sharp dividing line between what the school does and what the home does. This is as true at the university level as it is at the primary school level, for most universities in Africa provide food and rooms, medical care and, for those who want it, religious guidance, as well as teaching.

It is important that teachers should realise from the beginning that education is a shared procedure and cannot be otherwise. Although parents and teachers do each take more responsibility for certain parts of it, it is sometimes necessary that each must take over the other's share.

If we look at education in this way, we can see that it is just the old process of bringing up children, with some parts of the process handed over to specialists. The main reason for having schools and teachers is that in the modern world parents can no longer cope with the whole task of bringing up children. The world has changed and is changing so fast that the children need to learn some things that their parents cannot teach them.

Parents want their children to grow up into healthy, happy, well-mannered, well-respected people, who work hard, who can earn a good living, who can take their share in the affairs of their community, who will be dutiful to their old parents, and who will raise good families of their own.

In the modern world this means the children must go to school. But it also usually means that other people besides teachers and parents will have to help educate children. Doctors, nurses, and public health officers, for example, must help to keep children healthy and teach them and their parents how to avoid diseases and how to choose better food for their children.

If you think of education as a process of learning, you can see that it goes on for many years after childhood. Most people learn something about their work or their families, about how people behave, or how plants grow, or how the country is being run, nearly every day. Sometimes they learn because someone teaches them, sometimes they learn because they have seen or heard something new, sometimes because they have tried something new and it has either succeeded or failed.

This means that most people are continually learning from the other people around them, and of course children have much more to learn in this way than adults. This is what some writers mean when they answer the question: Who carries on education? by saying, 'The whole community educates'. They mean that we are all learning from each other all our lives.

Often the lessons learned have not been taught deliberately. People learn how to get on with each other by just living with each other. Merely by trying, a farmer will learn a great deal about how to handle tools, where to plant certain seeds, and how to get the best prices for his produce. In the same way a child learns, by trying, that certain people will give him food, some people are impatient, a frown on some faces means danger and on some that a joke is coming. Just by living with other people children and adults learn these things. This is what some writers mean when they say, 'Education is life itself'.

So you can see that there are many points of view on the nature and aims of education, with some truth in all of them, and there are more people concerned in carrying on education than you might think. Among these, the teacher is a specialist with a very wide responsibility.

THE CONTROL OF EDUCATION

So far we have thought of education mainly as a concern of parents and teachers, but who supplies the schools? Who pays the teachers? Who decides what shall be taught? At first sight there seem to be two answers to these questions. One answer is: the state. The other is: voluntary agencies, by which we mean any group of people or organisation, such as a church or a political party, or a 'foundation', that likes to run a school. In most countries almost any voluntary agency can build a school and pay teachers, but can it decide what shall be taught?

Usually a voluntary agency has to get permission to set up a school, and usually the state lays down an important part of what it must teach. Usually the voluntary school will be able to teach what it likes in some subjects. For example, a voluntary school will usually be allowed to teach any religion it likes or no religion at all, and it may pay special attention to any subject at all, such as music, or a language, or dancing or handwriting, so long as it also teaches what the state demands. But in some countries the state may not allow a school to continue teaching some religions or some political ideas. In the end, then, it is the state that says what must, and what may or may not, be taught.

Obviously, where the state says what may or may not be taught, school education is not merely concerned with bringing up children, but with bringing them up to have certain ideas and attitudes, to be people of a particular kind.

WHO CONTROLS THE STATE?

Who, we must now ask, decides what the state will permit, what it will forbid, and what it will encourage? Who decides what kind of people it will try to produce?

Before we can answer these questions we must say what we mean by 'the state'. In this context the state does not mean the country or the nation but all the institutions of government including the Ministries, the civil service, the police force, the army, the health services, the education service, and so on. Whoever controls 'the state' controls the whole country.

The state is simply a very complicated and powerful instrument that the government uses to foster its own values and achieve its own purposes. The government will, through the state, require the schools to try to produce the sort of people who will accept and foster its own values. In a democratic country, where the state is the instrument of society as a whole, and not of one man, religion or party, what values will the educational system foster and what sort of people will it try to produce?

The answer is quite simple: The basic value of a democratic society is the value it puts on the individual person and therefore the main purpose of the state in a democratic country, its very reason for existence, is to uphold and defend each person's right to be himself and to live his own life in his own way, provided only that this does not interfere with the rights of others.

The schools, as the instruments of society, must therefore have two main aims. The first is to help children to grow and develop towards fulfilment as individuals. The second is to produce competent citizens. The competent citizen of a democratic country is one who understands democratic values and democratic procedures, and is both able to maintain the degree of democracy already existing in his country and willing to develop it further.

The second aim is not more important than the first, but is essential and complementary to it. Without a large number of competent citizens a country may be taken over by forces hostile to it both from without and more often within. This has already happened in several countries in recent years. Those who have read a little history will know that in nearly every case the enemy has been within, and has been successful because he was able to get control of 'the state'.

Whoever controls the state controls society, and that is why the modern democratic society must have well-educated and competent citizens who thoroughly understand democratic values and are prepared to defend them. It is the duty of the schools to produce competent citizens, and however successful they are in other ways, if the schools fail in this they fail altogether. Therefore the teachers must understand well what knowledge, skills, attitudes and qualities of character are needed, and what methods of class teaching and school organisations will produce them.

CHARACTER AND PERSONALITY

Every thoughtful teacher will make his own list of the qualities of character and personality, of intellect and of experience, needed in competent citizens. But it is obvious that the fundamental democratic virtue, respect for persons, must come first.

This is the basis on which all forms of tolerance are built—racial, religious, political, intellectual and aesthetic—and without it all else fails. But it is not enough by itself. Our competent citizen must be both a knowledgeable person and a clear thinker, both critical and constructive, open to new ideas but judicious rather than enthusiastic, wanting always to understand, to have reasons and evidence for what he is asked to believe or do, sharply suspicious of all appeals based on authority instead of reason, and ready to give his own evidence and his own reasons for his own opinions.

Even a clear thinker needs to be familiar with the practical working of democratic institutions. His schooling, even at the primary level, should have begun to give him the experience of the give-and-take needed in committee work and in co-operative undertakings generally. This means that the democratic values and procedures must be built-in, in an appropriate manner, to the practice of every school, so that the children learn by experience to respect and weigh each other's point of view, to be considerate of each other, and thus to know what it feels like to be respected and to respect others.

But to learn the habit of respect for persons is not enough. This 'value' must be discussed and its meaning and practice in different situations made clear, so that by the time they leave school, children know both what they value and why they value it. For example, in organising a school journey the children should all be able to discuss what to do. Later they might discuss the value of everyone being able to make suggestions and come to see that everyone in the school has something of value to give to the others. If this kind of thing is not done, the children's values are likely to be mere sentimental prejudices and their principles mere empty words. And there is no room for prejudice or sentimentality in the democratic world.

It is not easy to differentiate precisely between character and personality. Perhaps we may regard character as a framework of firm attitudes that enables a person to pursue his arguments or aims in the face of opposition and to put his principles into practice even to his own disadvantage. We may think of independence, endurance and integrity as marks of character, but the independent person must learn to be co-operative as well, for integrity should be accompanied by an intellectual attitude that is generous and creative as well as critical. While we are considering all these qualities necessary for the competent citizen —the man who will defend democracy and make it work—we must also remember that the purpose of the whole thing is fulfilment or the living of the good life as each person sees it.

This means that teachers have constantly and consciously to look for and appreciate individual qualities in children and give them opportunities to develop those qualities. In practice this usually means that teachers should provide opportunities for children to experience, to respond, to express and to learn in their own different ways—and should show approval and appreciation of those differences. How this may be done will be suggested later when we discuss the teaching of school subjects.

If you now look back over the argument, you will see that we have extended the conclusion that the local community educates. We have now reached the idea that in a democratic country the aims of education are set by, or come from, the basic values of the whole society and that society, through the state, accepts the responsibility of educating children according to these values. Parents, teachers, and all other citizens have a right to express opinions and influence the course of educational policy in their country. But teachers, because they are the special servants and advisers of society in educational matters, have a special duty to think about the values and needs of society and to devise syllabuses, methods of teaching, ways of organising schools and classes, and methods of evaluation that will satisfy these needs. They must also think of methods of informing their fellow citizens about the way the schools work. This will enable parents to continue to take their share in educating their children.

THE AIMS OF CHILDREN

So far we have thought only of the opinions of adults about education. But what of the children themselves? Most teachers will feel that small children do not know what is good for them and should not be consulted about their education. There is some truth in this, but children are persons as much as other members of society and so are entitled to respect. The question for the educator is how to respect children, and how to find out their educational aims and needs without asking them. There is only one possible answer and that is, by observing them.

No sensible person would suggest that every child's whim should be gratified. But by looking carefully at our own children, and reading studies made by psychologists in various countries, we can see that all children have needs they must satisfy and tasks they must perform if they are to live happily and grow well. These are discussed more fully in chapter 3. Here it is enough to say that every child must satisfy his physical needs for rest, food, and exercise; his emotional needs for love, and approval; and his intellectual needs: to use his abilities, to make sense of his world, and to respect himself and learn how to conduct himself in his world. The tasks a child must learn to perform are simply the skills usual for children of his age in his community.

Teachers must include the satisfying of these needs among their immediate aims.

THE EFFECT OF CHANGE

We live in a rapidly changing world. A few generations ago most children were educated at home. Today, few parents wish their children to grow up without the help of the school.

In a mere hundred years the bringing up of children has altered drastically. Every year the rate of change increases and many of the older people find themselves strangers in a world that has left them behind. Does this mean that we, as teachers, are going to be out of date in a few years and that our pupils will find it ever harder to adjust themselves to new conditions? The answer to both questions is: Yes, that is exactly what is happening now. But it need not be so.

In the past, many teachers have resisted new methods of teaching and new interpretations of educational aims. They have stayed in the one rut all their lives. Many teachers do the same today, but the teachers of tomorrow will not be able to do that. They must be prepared to change continuously, to live a life of experiment and adjustment. What teachers of today can do is start questioning all methods and all syllabuses and building into themselves the attitude of expecting and welcoming change and improvement.

This does not mean that everything old is to be thrown aside, but that old syllabuses and old methods should be looked at as steps towards better ones.

The old education emphasised the memorising of facts and skills. The emphasis now is on thinking about principles and problems.

The old education was built on the authority of the printed word. The new education encourages a more critical attitude to the printed word. The old education prepared children to work at one fixed job all their lives, with little spare time expected. The new education tries to prepare children to undertake different kinds of work, and to develop attitudes and interests that will enable them to use spare time well.

The old education taught children almost all they needed to know. The new education must prepare them to go on learning all their lives. The old education tended to be concerned with life inside the school and to ignore the world outside. The aim now is towards fusing the life of the school and the life of the community.

The old education was fixed and changes were few from year to year. In the new we can expect change to be continuous and

and we cannot foresee what will be taught in ten years' time or how it will be taught. We have to be prepared to adapt ourselves.

All this makes teaching a more strenuous and adventurous occupation. We can expect it to be harder work, but it won't be dull.

SUMMARY

1. In this section we argued that education is bringing children up, helping them to grow and to develop and use all their powers. We implied that the process of education goes on as long as people are growing and developing.
2. Although parents and teachers have the greatest share in educating children of school age, all people are continually being educated by the community in which they live.
3. We have suggested that the aims of the educational system in any country are to be found in the values and purposes of those who control the state. In democratic countries the basic value is the value put on the individual human personality.
4. A major educational aim of the democratic state is to produce citizens capable of upholding its values.
5. In the changing modern world this means that education must be more genuinely intellectual and citizens more adaptable.
6. We have not said much about the aims of 'Education' apart from people and institutions because we think that 'Education' is merely a word, used by many people for many ideas. Words do not have aims. Only people have aims. So by 'the aims of education' we really mean only the educational aims of ordinary interested people like ourselves.

As teachers our question must be: what are *we* to adopt as *our* aims?

CHAPTER TWO

Natural Learning

In this section we begin to look for some principles of classroom teaching.

CHILDREN ARE INDIVIDUALS

When a teacher faces a class he has to deal with a group of children who are alike only in general ways. They are moving along a path of development towards maturity which is broadly the same for all. Physically all children develop in the same sequence—they all grow rapidly in childhood, crawl before they walk, walk before they run, get their second teeth at about seven years of age, shoot up rapidly in adolescence, and so on.

But within this broad pattern every child has his own individual pattern. They are born different in weight. They grow at different rates. They sound different. They move themselves differently over the ground, they walk and talk at different ages, and in any other respect that we can observe they are different.

There are some patterns of growth that have proved particularly difficult to observe—the patterns of intellectual growth—but as far as we can see, children develop intellectually in the same way as they develop physically. That is, the sequence of development is the same for all, but the individual rates of development are different, and each child has his own way of thinking and learning that is different from any other child.

For detailed studies of child development see such books as:

Gesell and Ilg, *Child Development: an Introduction to the Study of Human Growth* (Harper, 1949).

Breckenridge and Lee, *Child Development*, 3rd Ed. (Saunders, 1955).

Jersild, *Child Psychology* (Prentice Hall, 1956).

Olson, *Child Development* (Heath, 1959).

S.C.E.R.T., West Bengal
Date 12.2.85
Acc. No. 3103

Skinner (Ed.), *Educational Psychology*, 4th Ed. (Staples Press, London, 1959).
(This last book contains valuable articles by many writers on this and other subjects.)

Some of these books, by bringing together observations of hundreds of children, give averages or norms which describe what the 'average' child of a particular age (and place) is like. But these norms do not describe any individual child who is average. There is no average child. Therefore there is no reason to think that a child who is not close to the norm in some way has something wrong with him. Norms are not to be used by a teacher as a model of what a child ought to be like. Rather they should be used as descriptions from which each child differs. The special interest and value of every child is that he is *not* average but that he is individual, unique, different from every other child. He is valuable because he is *not* like anyone else but himself. He is valuable because he is different and irreplaceable.

The teacher's job is to help each child to make progress in his school work as a part of his development towards maturity. Not just maturity in general, but that fulfilment of a child's special individuality which is maturity for him. It is a job that requires understanding and imagination and self-restraint: understanding by the teacher of himself, as well as of children and why they act as they do; imagination to foresee the development and flowering of childish characteristics in the mature person; and self-restraint from efforts to mould the child after some image not related to that child's own personality. This does not of course mean that children should never be restrained by adults. Children often need and expect restraint by their elders as well as much help to restrain themselves. Discipline, leading to self-discipline, is necessary to full development of any individual and of any social order.

We sum up this general point of view in a principle of teaching:

The teacher must respect each child and treat him as an individual whose personal development and fulfilment is an end in itself.

370·1
CHA

S.C.E.R.T., West Bengal
Library

State Institute of Education

All other principles of teaching are particular examples of this first principle and are derived from our observation of how children develop, how children learn, and of ways in which they can be helped to fulfil themselves in the conditions in which they live. While we accept the fact of individual differences and affirm the value of individual persons, we must also accept the facts of school and classroom circumstances and affirm the value, for individuals, of living and working with other people.

Neither classrooms nor class numbers, in most schools, are designed either for the development of individuals or for working in groups with other people. They are fitted for mass instruction by inactive methods, and the weight of a tradition that placed much store on mass methods is still felt throughout most school systems. As practical teachers our task is to find ways of reconciling our principles with our circumstances. Suggestions for doing this will be made at many points in the following pages.

THE BASIC PROCESSES OF LEARNING

When a child is born he knows nothing but he can do several things—he can smell, suck, and move his head. He can feel cold. He can feel comfortable, and he can feel uncomfortable.

We cannot teach him because we cannot communicate with him, but he can learn because his central nervous system is affected by all his actions and feelings. Each action or feeling somehow changes him, so that he acts and feels differently after each new experience. It might be more correct to say that the child changes himself during each experience, for we must not think of children as pieces of clay that take any shape they are given by outside pressures. Each child is different and responds or reacts differently. We should think of an experience as being moulded and patterned inside the child according to the child's inner nature rather than of the child being moulded and patterned by the experience. The point to remember is that, with each experience in the stream of experience that is his life, the child changes. For him change and development are continuous.

It is characteristic of young children that they do whatever they can, and usually this is the very best thing possible for their healthy development. At first they do little but eat and sleep and all their energy goes into growing. Their bones lengthen, their muscles strengthen, and the growth of their nervous systems proceeds rapidly so that they get more control over more muscles.

This sort of physical growth and development is called *maturation* and of course it is basic to all other development. Quite obviously a child cannot see things clearly until he can focus his eyes, he cannot crawl until his muscles are strong enough. He cannot have complicated ideas about the world he lives in until he can bring together, in his brain, images or memories of sounds, sights, smells, movements and feelings that have occurred at the same time.

LEARNING BEGINS WITH ACTIVITY AND EXPERIENCE

But maturation by itself is not enough to provide, or describe, development. The child who knows nothing at birth does not get to know things by just growing, but also by doing. Maturation gives him the power and possibility of doing things, and as soon as the child *can* do them he does do them. He finds out what he can do by doing everything he can, and every time he does something he changes himself just a little. Thus the next time he tries he can do a little more or act a little differently.

Development results from doing, as well as from growing.

A baby will kick, grasp, and taste everything he can reach. He will even grasp his own toe and pull it to his mouth. Because every such movement is recorded in some way in his nervous system, he comes to learn which parts of the world are parts of him and where different parts of him are. For example, he learns where his mouth is and how to get things to it. This does not seem a hard task but it may take a baby weeks to learn to find its mouth. If you watch an older child learning to use a spoon to feed himself you will see how he has to make many, many attempts before he learns to do this well.

We can say that all this learning is learning by experience, which includes all kinds of learning: learning by doing, learning by exploration, learning by discovery, learning by trial and error, and learning by insight—that is, learning by seeing the connection between what he does and what the result is. (Do these different phrases really point to different kinds of learning, or are they just different ways of looking at the same thing, or different parts of a total process of learning?)

Of course, the child is not aware that all this is learning. He just goes on enjoying doing things and though he does not deliberately practise to improve in everything he tries to do, he does improve, by enjoying what he does.

LEARNING TO USE THE SENSES

How much a new baby has to learn by experience, and how closely tied up with maturation this is, it is almost impossible for an adult to realise. When we say that he knows nothing, we mean that he does not know that there are different tastes, or different smells, or different sounds. He does not know how to make a sound. He has no idea of space or time. He does not know how to listen, how to think, or even how to see.

As his sense organs, which are not completely developed at birth, become mature he has to learn to use them. For example, every baby has to learn to see, and it takes him a long time to do so. It is hard for an adult to realise that everyone has to learn to see, but even adults, who have been blind from birth and have been given their sight by a surgical operation, have to learn to see. At first they cannot see any difference between an orange and a square block. Only after much feeling of the block and the orange do they come to see the differences in shape.

Children have to learn to see triangles and other shapes, too. If you give 4- or 5-year-old children some cut-out shapes to put back in their holes, you will realise that they are still learning to see shapes. They also have to learn to see sizes and distances, differences in texture, and different shades of colour.

How does a child learn to see distances—to discriminate between the near and the far? At first he reaches out for everything he sees, whether it is an orange or the moon. Very slowly he learns to see distances by the experience of space or distance that he gets from reaching and touching what he can reach.

When he can crawl, he gets more experience of moving through distances. When he can walk, he learns even more about space and distance from his senses of touch and muscle feeling. It is in this way that he learns the meaning of what he sees. It is the same with sounds. The child learns slowly to make new sounds and to discriminate between sounds. His eyes help him to learn about near and far-off sounds, and to see how sounds are made, so that in time a dog's bark comes to mean a dog, even if no dog is in sight.

LEARNING TO THINK

In learning how to use their muscles and their senses to explore and understand and control the world about them, children are also learning how to think. In essence, thinking is the process of bringing events and feelings together so that they make sense to the thinker, that is, so that the thinker can see connections or relationships between them. When the thinker sees connections between events he says he understands them. When he sees one event as leading to another, he says that the first explains or causes the second. The effort to see connections between past, present or future events is usually stimulated by some difficulty that crops up in the thinker's life.

When any person comes up against a difficulty and tries to deal with it by understanding it, that is, by seeing it as a problem to be studied and solved, he is thinking. Of course when most people think they do not say to themselves, 'Here is a problem. I will try to understand it by exploring the connections and relationships of the materials and events in this problem and then I will be able to see how to deal with it.' But they act as if they were saying this to themselves. Adults, very frequently, explore a problem in their minds before they act. If it is a matter of balancing one thing on another, they may first go through the the motions in imagination, then they act. But a young child trying to deal with the problem of getting one block to balance on another simply tries with his hands until he is successful. In the course of time he sees the connection, perhaps rather vaguely, between the position of the top block and its stability, and after many experiences of similar problems he may arrive at a stage where he can balance many blocks on top of each other.

The child cannot, of course, explain that the trick is to keep the centre of gravity over the base and to keep the tops and bottoms of the blocks level, so that one does not slide off the other. But experience has taught the child to do this and he does not forever have to learn these procedures anew.

This is how a child learns to understand how his world works and how he can control it so that things happen as he wants them to happen. This is how he builds up the stock of basic ideas that are necessary for effective action and effective thinking.

In learning these ideas, and in learning to use them, the child is learning to think, and you can see that he is learning to think with his hands and, indeed, with his whole body.

Any person's thinking power consists not only of his inborn ability but also of the stock of ideas—tools of thinking we may call them—at his disposal.

For example, even a very intelligent person who has the basic idea that diseases are caused by evil spirits has a very low degree of thinking power in the field of medicine as compared with an equally intelligent person whose basic idea is that diseases are caused by the presence of physical things such as germs or the absence of physical things such as proper food.

We adults are hardly aware of many of the most important ideas that we use, because they were learned so long ago and often without the help of words. These are ideas that every child has to learn by experience, such as that even when a thing goes out of sight it still continues to exist; that water always flows down; that big things are usually heavy; that if you let something go it will fall; that if food, or anything else, disappears from a shelf it must have been moved by something or someone; that dolls and masks are not alive and have no feelings of their own; that if you pour some orange juice from a wide glass into a tall narrow glass the amount of juice does not change; and so on.

Of course all a child's ideas about time and space and the nature of things are not formed before he comes to school. Moreover, the ideas that *are* formed will be developed and made clearer in school. But most of the basic ideas and attitudes that a child needs will have begun to form before he goes to school. This is a result of direct experience through the senses—experience which the child turns over and re-organises in his brain until he has moulded it into a pattern that makes sense to him.

LEARNING TO COMMUNICATE

The greatest help that a child has for organising and re-organising his experience into a pattern of ideas that make sense is the ability that he begins to develop, sometime in his first year of life, to communicate through symbols.

A symbol is a sound, or a mark, or a movement, or anything else that is used to stand for an idea or a feeling. When two people use the same thing to stand for the same idea, they can communicate with each other. For example, if two people use the same sound to mean 'danger' one can make the sound and the other will immediately find the idea of 'danger' present in his mind. Usually a symbol is very much simpler and easier to handle than the idea it stands for. Imagine, for example, the vast range of meaning that is represented by such words as 'home', 'school', 'Africa'.

Words are symbols. They stand for ideas, feelings or relationships, and we have only to think for a moment to see the value of words for thinking and for carrying on everyday life. We use words to share our thoughts with other people. We adults, especially, use words as our main way of bringing our thoughts to consciousness so that we can examine them. We depend on words so much that we can hardly think of communicating or thinking except in words.

But words are not the only symbols, nor are they the first mode of communication to appear in a child's life. Words are, indeed, among the most sophisticated and difficult of all symbols to handle, and children use a wide range of other symbols to help them carry on their thinking during the years in which they are gradually learning to handle words adequately.

How does a child learn to use symbols to communicate? The baby who begins to relate the smell and taste and feel of his mother with her sounds and her appearance is on the way to using symbols. When he cries he sometimes hears his mother call to him and stops crying to listen and smile—the sound of her voice has come to mean the comfort that she brings and the baby is happy with the feelings and thoughts aroused by her voice. She has, in effect, sent a message that means, 'Don't worry. I am here. I am coming.' The baby has, in some degree, grasped the message, stopped worrying, and begun to look for her with pleasure. The message has come through sounds that stood for something else—thoughts. That is, it has come through symbols. But the symbols used are not words, for the baby is still too young to grasp the pattern or shape of a word or a sentence. The message has come through the tones of his mother's voice, and these tone symbols are more musical than linguistic.

The mother may add smiles or frowns, and even the way in which she holds her baby, to her musical mode of communication, and this, we may think, is the beginning of communication through mime and movement. All these ways of communicating are in use long before the baby can assign meanings to words, or can even distinguish words from each other. But development towards speech has already begun, for all the time the mother talks to the baby and the baby responds with sounds of his own. As his muscles and his senses mature, he learns to discriminate sounds and to control his own sound-making. With this growing control and discrimination of sounds comes a gradual connecting of meanings and sounds.

LEARNING TO TALK

The child, we then say, is learning to talk. Can we say that his mother has taught him to talk?* Or would it be more correct to say that his mother has provided the conditions in which it was possible for him to learn to talk? What she has really done is to share her life with her baby. Along with the shared experiences of feeding and washing and handling and hugging there has been much talking, sometimes baby talk, sometimes real

---

*For a detailed account see M. M. Lewis, *How Children Learn to Speak* (Harrap).

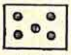
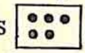
words. Either way the mother has provided a constant stimulus to the child and he has responded with his own sounds. The sounds that have brought his mother to him have come to mean 'mother'. With his control of his mother by the use of the word 'mama' the child has begun a new way to conduct the affairs of his life—a new and effective form of behaviour. It is a form of behaviour that has developed out of shared experience and the maturation of the child's physical and mental powers.

Once they have begun to use words most children delight in learning new words. But learning to say words is not the whole of learning to use them. Both before and after coming to school, children often use words incorrectly because they do not have satisfactory meanings to go with the sounds. The development of language requires a source of new words and new sentence forms, and this is usually present in the older people the child lives with. It also needs practice, and usually parents allow their children to talk freely so that they get as much practice as they need. (Unfortunately many teachers do not do as well as parents in this respect. Most teachers give the children far too little practice in using the new words they are learning.)

But new words and plenty of practice are not enough. The words must also carry adequate meaning and this can only come from adequate and varied experience of the use of the word. The child needs to meet new words in many situations so that the full meaning and use of the word develops. The need for varied experience is greatest wherever a word stands for an idea or is used to identify something as a member of a class of things. For example, the word 'chair' can only be used correctly by a child who has an idea, or concept, of a chair. When a child refers to a stool or a bicycle seat or a bed as a chair we know that he has not got the concept of a chair, although he is on the way to it.

DEVELOPING GENERAL IDEAS OR CONCEPTS

We can see what is necessary to develop such a concept if we think of a few cases that are well known because they have occurred more than once. There is the example of the child who had been shown a piece of paper and told it was a square. He had used many squares of paper to play with and thought he knew what a square was. One day he visited a cousin who lived in a street with a garden in the middle of it. 'Let us go and play in the square,' said the cousin. It took some little time for those two boys to understand each other because one thought a square was a piece of paper and the other thought it was a piece of road. What they needed was a great deal more shared *and varied* experience of the use of the word.

A child gets his word meanings from the situations in which he meets the words. A little boy who plays dominoes may think this pattern  is five, and this  is not. A little boy from a town may think a tarred road is a road, but an earth road is not a road at all. Yet when he has had experience of the use of the word 'road' to mean a tarred road, an earth road, and a road of stones, he will probably have a sufficiently general idea of what a road is to recognise a glass road if he sees one.

Perhaps the most remarkable thing about helping a child to improve his use of words is the small part that explanation plays. Let us take, for example, a small boy who says, 'I am five.' He may be quite right, but what does he mean? Perhaps he knows his little sister is four and his big brother is six. If he connects these words and sizes he may be at the beginning of understanding the meaning of 'five' and perhaps, also, of 'years'. Give him time and experience and much talking with other children about how old they are and he will grasp the meaning of numbers and of years. But try to teach him quickly by explaining and you are likely to produce only confusion and distaste.

CONDITIONS FOR LEARNING

The fact is that young children have to discover most meanings for themselves, at their own rate, and in their own way. What adults can do is to provide the right conditions which are: (1) a happy group of people within which the child can have confidence to try out words and meanings and play with them till he controls them; (2) plenty of varied experiences in which there are plenty of meanings to be discovered; (3) many opportunities to talk with adults and other children so that the child can learn new words, practise them, and correct his use of them.

CHILDREN SET THEIR OWN GOALS

Given these conditions, children will learn to think and to use words to express and extend their thinking, and in their own native language they will need very little more until they are well on in the primary school.

For teachers, one of the most interesting and challenging observations we can make about children who have not yet come to school is that they learn language—that difficult skill—with no set lessons and with great joy. Given a chance, they do not require to be pushed into learning. Quite naturally they take each next step along the path of learning, going always at their own natural speed and going always forward.

For children, the world is full of invitations and opportunities and challenges to do things they want to do. Children want to extend their control over themselves, or the world around, or over words, by attempting always something that is just a little harder than they have attempted before. In a group of trees each child will pick out the tree that is right for him to climb and it is seldom that any child makes a mistake. So it is with other activities—lifting stones, jumping ditches, helping mother, or learning to sing a song—they like to do whatever they can do.

In that way they learn and extend their powers and prepare themselves for the next step. They like to be independent and do things themselves, but they will seek help from adults when they need it. They do not need someone to be always telling them what to do and how far to go, and when to stop. But they do need to feel that there is, somewhere about, an adult stronger and wiser than they who will see they do not get into trouble.

CHILDREN USE OTHER LANGUAGES

So far, in considering how children learn, how they learn to think, how they organise their thoughts, and how they express their thoughts, either to communicate them to others or for their own satisfaction, we have concentrated on word language. Word language is probably the most important method of communication in human life, but it is far from being the only one. There are some thoughts and feelings which words cannot express either well, or at all. The musicians, dancers, actors and artists of the world all use symbols other than words to express what they have to communicate to the world.

No one can say in words what a carver says with wood or a drummer with the rhythms of sound, or a dancer with the movements of his body, or a weaver with his patterns of colour and texture. The deepest sorrows and joys and perplexities of life are not necessarily expressed, or expressible, in words, even by adults. This is even more so for children because they have so little power over words. In some other languages, however, they can invent their own symbols and express feelings that would not always be approved by their elders if put into words—feelings which have, nevertheless, to be dealt with somehow.

The most common of these other languages is seldom thought of as a language. It is imaginative play, and if we wanted to relate play to an adult form of expression we would call it drama or dramatic-play. Play is the main way in which a child can think over the incidents of life and try to grasp the meaning of the world. The little girls who nurse corncobs, the little boys who pretend to read father's newspaper if they live in the town, or hunt with his bow if they live in the bush, the children who play at house work, or being traders, or big chiefs, or the doctor, are trying to understand what goes on in their world and why adults act as they do and what it is like to be a man or a woman. These children make themselves into symbols of adult life and act in order to understand.

Children who have materials with which they can draw or paint, draw pictures of whatever is important to them at the time. They produce hundreds of pictures of home and mother, and themselves. These pictures are symbols. The children are not interested in producing photographic pictures. This, they may say, is father, and this is mother—and they will make mother bigger than father because just then their thoughts are more concerned with her. Size itself has a symbolic meaning in these pictures.

When children sing happily or sadly, though they use no words, they are expressing their mood. When they dance, their movements are a clue to their emotions. The great advantage of all these non-verbal languages is that the children can invent symbols and express exactly what they want to express, without being corrected by adults or hampered by the lack of words.

Often, of course, the child who acts also talks to himself, the child who paints may say what he is painting, the child who dances may sing as well. There is no reason why several modes of expression should not be carried on at once, for it is probable that a child is better able to use such a difficult mode of expression as words because he is finding out what he thinks and what he wants to say by using another mode at the same time. All of these modes of expression help to make the experience that is their subject clearer to the child. By expressing himself in several ways he is able to deal more fully and effectively with his problems or fears, and to enjoy more thoroughly the pleasures that he re-lives.

Children, of course, live from day to day and no one expects them to analyse their lives and see where all this activity and expression is leading or what it is doing for them. Their goals are as limited and immediate as are their joys and sorrows. But an observant adult who is trying to understand what is going on can sum it up in a way that relates the child's education before school to his education in school. What the child is trying to do is to understand his world, to find out how it works and how he can control it. He is trying to understand people and find out why they act as they do and where he fits into the life of his community. He is trying to understand himself, to find out what he can do and to develop his powers, and he is trying to win the respect of his friends.

WHAT CHILDREN HAVE LEARNED BEFORE SCHOOL

If we ask how successful most children have been by the time they come to school at the age of five or six, we can usually find that they have made a good beginning.

They have begun to learn to speak their own language, and some of them have begun to speak more than one language. Included in their speaking are many words dealing with quantity such as big, bigger, long, small, heavy, light, strong, and the first number names, and some names for shapes such as 'round'. The use of these words tells us that children have learned already the beginnings of arithmetic and, indeed, of mathematics.

They have also learned about the qualities of many natural materials such as stone, sand, clay, and water. They know that a stick will carry a load but a thin piece of clay will break easily. They know a little about animals and plants. They know a little about balancing themselves. And these are the beginnings of the physical sciences, of botany and zoology, of hygiene and of physical education.

They enjoy some things because they are beautiful. They use some materials to draw or model with. They mimic other children and they act out situations in life, playing at being fathers and mothers or doctors or soldiers. They sing or hum to themselves sadly or gaily, and they move their bodies about when stimulated by music. This is the beginning of art and drama, of music and dance, and of aesthetic appreciation.

They know some things they should or should not do and they look after their younger brothers and sisters and keep them out of harm's way. This is the beginning of social responsibility.

There is not much in the intellectual or aesthetic world of adults that has not got its beginnings in children's natural learning, interest and activity before they come to school. That is the answer to the question about the success of pre-school education in the home where the child is his own teacher for a great deal of the time.

The question we must now ask is: How can we carry on from this good beginning? and the obvious answer is that we must think carefully not only *how* children learn but also *why* they learn.

We have already considered how children learn—by activity, through their muscles and senses, by direct experience, by shared experience, by thinking over their experience with the help of many kinds of symbols, by experiment and exploration and discovery, by practice, by seeing connections, by insight. Many of these words overlap in meaning but none of them gives any idea of why children learn.

In discussing how children learn we have many times referred to one reason—their need to understand and control their world. But the reasons why children learn, and why they sometimes refuse to learn, require further discussion.

CHAPTER THREE

Motivation

In this chapter we continue our search for practical principles of teaching.

WHY DO CHILDREN LEARN?

This question is one of a whole group of questions which may be summed up in the general question: Why do children behave as they do? This is a very complex problem indeed, and, as with many other complex human problems, we are very far from finding the full answer. One thing we can be sure of is that there is no single and satisfactory answer that is also a useful one. We can of course, reply, 'Because that is their nature' or 'Because Allah wills it'. But such answers are no help in the classroom, simple and true though they may be.

Adults who have faced this question have followed the same sort of thinking process that we described for children in chapter 2. They have collected their experiences of children together, and turned them over in their minds. They have talked about them and tried to see connections between their different experiences of children and what they knew of the rest of the world. Eventually they formed a pattern that seemed to make sense.

Naturally such patterns have usually been in line with the other ideas held by adults at the time. If the thinkers believed that everything in the world was controlled by good or bad spirits, it seemed to make sense to think children's behaviour was also controlled by good or bad spirits. If the thinkers believed that to find out about anything important one must read what Aristotle or Solomon or some other wise man of the past had to say about it, they did the same with children's behaviour. They thought it would be foolish to imagine they could possibly know more about it than Solomon or Aristotle.

In the 19th century and early in this century scientists began to supply important new ideas. Men who had studied insects, birds and animals explained the ways in which ants ran their affairs and birds built their nests without being taught by saying these creatures had instincts. These were built-in patterns of behaviour and the creatures concerned did not have to learn what to do. They acted as they did because they could not do anything else. The suggestion that children's behaviour was controlled by instincts seemed to the men of this time to make sense—for children at birth did not have to learn to suck or breathe, and so on.

It was in the 19th century that pyschology—the science of behaviour—became established and therefore many of the early psychologists relied on the 'instinct' theory.

Others, however, began to point out that children act in so many different ways, and learn to do so many things their ancestors could not do (which never happens with ants), that very little of their behaviour could really be called instinctive. So the idea that children behaved by instinct was reduced to the idea that their behaviour was based on 'instinctive tendencies' or 'propensities'. Today even these ideas are seldom mentioned. Perhaps the most important reason for this is that the instinct explanation has never been very useful in practice.

In recent years psychologists who have thought about this question of children's behaviour have put more emphasis on observing *what* happens than on thinking *why* it happens. When they seem to be explaining *why* children behave as they do, they are really only summing up their observations of what happens to different children or what different children do in different circumstances. This approach to the problem is to be found in the idea of 'basic needs', which, with its accompanying idea of related development, is the psychological foundation of this book.

BASIC NEEDS

The idea of basic needs is a simple one. It is that all children have a number of needs that must be satisfied if they are to grow and develop towards maturity in a healthy way. Some of these needs are physical, some are psychological—and we may even think of them as intellectual and emotional. Some may be more basic than others in the sense that unless they are adequately met the child will not survive at all—for example, the need for air. If certain other needs are not met the child may survive but be mentally crippled or a social misfit—for example, the need for affection.

The existence of an unsatisfied basic need may become apparent in a child's behaviour or his development. But it is not necessarily indicated by the 'wants' that the child himself is aware of and expresses. The connection between different kinds of behaviour or development and the satisfaction of basic needs has been found by long and patient scientific study by psychologists and doctors. We now know that, though a child's want may indicate a need, it is unlikely to tell the whole story. A good example of this is a child who is hungry. The child has a want for food and he will satisfy this want in any way he can. If he cannot get food by lawful means he will steal it. As long as he is hungry his attention will be on getting food. If he is in school, it will not be easy for him to give any attention to his lessons, unless success in them is his quickest way to getting food.

But even when the child has had his stomach filled and no longer has a want for food he may still have an unsatisfied basic need, and this will affect his physical development or his mental functioning. For example, the food which has satisfied his stomach pangs may not have satisfied his need for lime or for some of the other elements or vitamins that are necessary for a healthy child. So he suffers from a deficiency disease such as scurvy, or rickets, and this is simply another way of saying that development has been affected. In some deficiency diseases the child's ability to think is badly affected, yet when the deficiency is made good he can get on with his school work quickly.

So it is with other basic needs. The child's behaviour will always be adversely affected if he is not satisfied, and the child will always attempt to satisfy them as far as he is able. His attempts are very often likely to be mere reactions to a situation he does not understand. We cannot expect that a child will recognise what is wrong and put it right for himself. Indeed, it is very seldom that even adults can do this for themselves. But we can expect that teachers will take a scientific and detached view of children's behaviour. Good teachers will make some attempt to diagnose the situation when they find children in difficulties, either emotional or physical. They will not merely blame or punish, but look for what has gone wrong and try to set it right.

The concept of basic needs provides a useful approach to the understanding and handling of children's problems, especially problems of a psychological nature. This concept can be used by teachers in planning their classroom organisation and procedure, their teaching programmes and their handling of children.

Although basic needs may be classed as physical or psychological, a psychological need may have a physical effect. For example, a boy who thinks his mother no longer loves him may lose his appetite and refuse to eat. Similarly, a physical need may have a psychological effect. For example, a girl who has worked too hard at home and had too little sleep is unable to do her arithmetic at school. In such cases the best way to improve the appetite is to convince the boy he is loved. The best way to improve the arithmetic is to provide more time for sleeping—and no other course of action will be completely satisfactory.

Physical Needs

The most obvious physical basic needs are for fresh air and a suitable temperature; for food and drink, and for excretion; for change of position, rest and sleep; for physical exercise, and for the use of the body in exploring the world, in construction, and in expression.

It is true that at times only a medical doctor can tell whether a child's physical needs are being satisfied. But quite often a teacher can improve his teaching if he can take a hint from a child's persistent behaviour that some physical need requires to be satisfied.

For example, some teachers are worried by young children who are always changing position. They use an unscientific and condemnatory word for this behaviour and urge the children to stop fidgeting, to sit still. But the children cannot sit still. Their bones are soft and their muscles are soft too. Sitting in one position for a long time puts too much strain on the muscles and prevents the flow of blood through their flesh. They must move. A sensible teacher will learn from his children that they need more activity and will plan accordingly. Unfortunately it is not easy to be sensible if we think in rigid ways. If we believe that there is one correct position for a child who is writing, we will be worried that some children want to get their eyes close to the paper. We should learn that, if children show a continued urge to do this, there is possibly a basic need that they are trying to satisfy. And this, in fact, is the case. For young children's eye muscles are quickly tired by focusing on fine work like writing and they put their faces close to the paper to give the muscles a change. If we succeed in preventing them from doing this we are guilty of causing eye strain.

A sensible teacher will observe that young children need frequent changes of position and will plan his work along activity lines. He will not begin by blaming the children for their inconvenient behaviour, but by asking himself why they behave like this and how he can satisfy their needs, while at the same time getting on with school work. The same inquiring approach to children's difficulties will help teachers to find many children who learn poorly because they are partly deaf, or cannot see well. Once found, these children may be given the places and the extra help they require to learn well.

Psychological Needs

It is possible to organise our observations of children's needs either into broad classes of need, or into larger numbers of very specific needs—as was shown in the case of the need for food. It seems more practical for teachers to use a smaller number of broad classes of need as a framework on which to build their understanding of children and their development. We suggest the following:

1. *The Need for Affection.* Affection is a two-way need. The child's need is to love as well as to be loved. The need for affection is

first seen in the baby's need for its mother's love expressed in frequent close physical contact and constant care. When this is absent, babies fret, and no matter how well they are looked after by nurses or doctors, how carefully cleaned and scientifically fed, nothing makes up for mother love. This is not to say that mother love can be given only by the actual mother, but it must be given constantly by a motherly person in a motherly way.

Out of a full share of motherly love, the child develops the firm conviction that he will be loved and accepted whatever he does. Children whose mothers try too early or too hard to train them to drink from a cup or to control their bodily functions sometimes learn to doubt whether they are loved and accepted unconditionally by their mothers. This feeling, as they grow older, may make them uncertain of their relation to their friends. They may be a little anxious about their place in the affections of their group and feel the necessity of making sure that they are accepted. This may lead them to do what the group does, even though they know it is wrong, because they cannot bear to stand alone. Or it may lead them to a series of unnecessary naughty and annoying acts which seem to have only one purpose—to test whether they are still loved.

The need to love and be loved does not cease with babyhood but continues all through life. Its satisfaction in family life and in friendship is the most important and all-pervading of all emotional satisfactions. In the school it is important that this need be met, along with other needs of a more obviously intellectual nature. The children, especially the newcomers and younger children, should find a generally warm and welcoming atmosphere and a teacher who will love them and whom they can love. Without this the children cannot be happy and their work, especially in the expressive subjects such as language, art, and drama, is unlikely to be of good quality.

The child's need is for affection without qualification. He wants to be sure that he will be loved and will not be rejected, whatever he does. This does not mean that teachers have to like, or to appear to like, everything that a child does. There is a difference between a child and what he does, and the difference should be clear to him as well as to his teacher. Neither does it mean that children should be allowed to behave in any way they like. Children rely upon older and wiser people not to let them behave too badly. They expect to have some share in deciding their own conduct, but they know they are only learning how to conduct themselves and they do not expect to be entirely undirected. To give affection is to care for a child, but to value him too highly is either to let him get into too much trouble or to allow him no freedom at all to make judgements and so to make mistakes. To learn to conduct himself, a child needs to have enough freedom to make some mistakes and to get into some difficulties—but not great difficulties.

2. *The Need to be Independent.* From his earliest days a child wants to do things himself in his own way. As he grows older, if things go well, the desire for independence grows and the child becomes more able to act independently without infringing on the rights of other people.

Children whose need for independence is frustrated at home by over-protective or dominating parents may find difficulty in meeting the demands of life outside the home. They tend to rely on their parents all their lives and always to look backward. Instead of exercising their own judgement freely, they ask themselves what their parents would have done. Such children cannot enjoy responsibility, though their natural abilities may otherwise fit them for it.

In this regard, however, schools are usually much worse educators than are homes. Most schools give children far too few opportunities to act on their own judgement. The teachers seldom allow the children to think or try or choose for themselves, to criticise, to plan, or to learn from the experience of trial and error. Such teachers are afraid to open their minds. They cling to the belief that there is only one right way to form each letter, to do each sum, to draw a map or write an essay, and they teach accordingly. Such methods stunt the minds of the pupils.

Children cannot develop intellectual creativeness and flexibility and a sense of adventure and excitement in learning, if they are never allowed to be independent and to do things in their own way. Probably the most important criticism that can be made of any school today is that it does not satisfy the pupil's need to be independent and adventurous. School then becomes something to be endured instead of something to be enjoyed. The result is first boredom and then a failure of confidence.

3. *The Need to Understand.* One has only to look at children before they come to school, or when they are away on their own, to see that they are constantly trying to find out about their world, to explore every part of it, make sense of it and get control of it. Babies practise movements and sounds for hours, they follow people with their eyes, they taste everything within reach. Older children poke into every corner and act every adult situation they know about. They talk to themselves, telling themselves what is happening. At school, given a chance, they try to understand everything. They ask questions (unless they have learned not to) and they try everything. Children have no need of St. Paul's advice: 'Try all things. Hold fast to that which is true.' Like St. Paul, they know well that this is the path to understanding. Scientists act on the same advice. We teachers must be sure we do not get in the way.

In the adult world, the need to make sense of the world and get control of it is one of the most important marks of humanity. What are religion and science but attempts to understand and explain? What are magic and technology but attempts to control the world and make use of it?

Teaching that genuinely satisfies this need helps children to develop into lively, enquiring, confident, and open-minded people. Those who do not have this need satisfied, but are taught instead in an authoritarian way, parrot-learning the answers from the textbook or the teacher's notes, tend to become rigid and authoritarian themselves. This is exactly the opposite of the kind of citizen a democracy needs.

4. *The Need to use one's Abilities and Powers.* Children who are allowed to use all their abilities are usually happy and satisfied. If directed well, they go on to use their powers more and more effectively and usefully. Children who are not permitted to use all their powers are likely to be unhappy and frustrated.

In addition, expecially if they are clever, they may develop mental habits that make for little work and slipshod thinking. Anyone who uses his powers to the full on some project that challenges him and that he thinks is worthwhile will develop them further. He will gain confidence and will enjoy using his powers. This is what is meant by fulfilment, which, for those who think of education as living and growing, is one of the aims of education.

The frustrating and narrowing effect of not being permitted to use one's powers is seen in every stage of life. Probably every reader of this book can think of such occasions in his own life as well as in the lives of his friends. History is full of embittered men who have not been able to use their talents. Our job is to make sure that the schools are not full of embittered, or bored, or impatient children because we have not provided the opportunities for them.

5. *The Need for Adventure*. This need is sometimes thought of as the need to be creative, and is, of course, very closely connected with the need to understand, the need to use one's powers and the need to be independent. It is easy for a conscientious teacher to think he has satisfied children when he has given them a degree of independence and some opportunity to use their abilities in routine learning situations that make no demands for original thinking. This can be done without ever bringing in the opportunity to put forward a new or fantastic idea.

But that is not enough. There are two main lines of intellectual activity and both are important. The first and the most common in good, sound schools is that of the *consumers* of thought, who constantly look at other people's work and use it or enjoy it. They read other people's stories, learn what other people did in the way of exploring, hear other people's ideas on science, arithmetic, or language, sing other people's songs and hear other people's poetry. They listen on the radio to other people producing plays written by yet other people. In physical education they go through the exercises that someone else has worked out. They like or dislike, enjoy and practise, praise or condemn.

All this is fine appreciative and critical activity and we cannot do without it. But by itself it misses the point of education in a democratic country which is to help more people to be *producers* of thought. This means having some of their own ideas, making their own stories, their own poetry, their own music, their own physical exercises, working out their own ways of doing arithmetic and making their own scientific explanations, as well as sharing what others can produce.

Our world is in great need of people with ideas of their own, as well as of people who can repeat, enjoy, or criticise. Both these lines of intellectual activity can be stimulated by proper education. We must realise that children in schools have a need to be creative, and that if this is not satisfied their development must be lop-sided, incomplete and unsatisfying. In industrial countries there are large numbers of people who never have much opportunity to do things in their own way and especially to do things with their hands. They are full of young people who are a problem because they are dissatisfied with their dull and empty lives and are on the look-out for excitement, which is a substitute for adventure and for creative activity of some sort.

This underlines the important fact that teachers have to recognise: that basic needs must be satisfied somehow. If they are not satisfied in good and healthy ways they will be satisfied in bad and unhealthy ways. Children are driven to satisfy their needs by their very natures.

Sometimes they fall back on substitutes, as when a starving person will eat earth, and sometimes they exist with a minimum of satisfaction. But for development there must be some satisfaction of all needs, and for maximum development there must be maximum opportunity to satisfy all these needs.

If teachers find things are going wrong, it is in this direction that they must look for the causes.

6. *The Need for Approval by adults that the child looks up to.* A child not only wants to be liked, he wants to deserve to be liked. Unless he can earn the liking and approval of his elders, he regards himself as a failure. Every child should succeed in learning and doing what is within his abilities, and should get

approval for doing so from his teachers, from parents, and from other important adults. Every teacher knows that nothing succeeds like success and that 'hope deferred maketh the heart sick'.

It is the teacher's duty to see that every pupil without exception meets a good deal of success and gets a good deal of approval. When this does not happen the school is at fault. In the circumstances of today some teachers may not be able to organise enough success for every child. We cannot always blame the teacher, but we can recognise the fact. This sort of fact is one of the main arguments for smaller classes—so that the teacher can see that every child gets work matched to his ability and achieves a reasonable amount of success in the face of a reasonable amount of difficulty.

Without success and recognition the child becomes dull and may give up the struggle. With reasonable success and recognition he continues to try and to make progress. Nothing succeeds *but* success and therefore every teacher must start teaching, setting work and making demands at the point where the children concerned can be successful. Nothing else will work. Nothing else can work. So-called successful teachers who do not plan in this way are really only successful, by luck, with that small part of their class that is able to get success without the teacher's help. In a professional sense they are not teachers at all.

7. *The Need for Approval and Acceptance by other children.* This is sometimes called the need to belong. A child who is despised or simply left out will be miserable. Often, adults are inclined to blame the child who is left out and not liked and say it is his own fault. But the child is, at least partly, the victim of circumstances—his heredity and his bringing up—and the teacher's job is not to blame but to help.

It is not always easy for a teacher to see either that a child *is* outside the various groups of children—belonging to no circle of friends and sharing no special interests—or *why* he is outside. Sometimes a child's known troubles may be traced to this cause, sometimes the teacher, seeing that the child is an outsider, becomes aware that the child has troubles. Either way it is the teacher's job to try to find out more about the child and to make opportunities for him to share in work and in small responsibilities. We cannot compel a class of children to be friendly, but we can sometimes make it easier for unusual children to be appreciated by others and to feel they are a part of the class and not merely someone who sits in the room.

8. *The Need for Self-respect.* At birth a child has no ideas, no mind, no self. He is not aware that the world is made up of his own body on the one hand and everything else on the other.

Gradually, in ways we have already hinted at in chapter 2, he becomes aware of the world and of his body as separate from it. In the development of these ideas we see the beginnings of the mind and of the self. 'Mind' is a vague word with many meanings. Here we use it to mean the whole machinery of ideas and attitudes that a person has learned or constructed from experience and which he uses to deal with new experiences. The mind includes the child's picture of the world. The 'self' is a part of the mind. It is the set of ideas that a person has of what he is at any particular time, and his self-respect is his judgement of the worth of such a person as he thinks he is.

The self is not the same all the time. A person may talk of his better self, which is his idea of what he is like when he is on his best behaviour. Or he may say that he was not quite himself when he behaved badly, meaning he had fallen below his idea of what he is 'really' like. Or he may talk about his old self, meaning that he has changed.

Each of these 'selfs' is a part of the person's own picture of what he is. This may not agree with the picture other people have of him, but if the child is to be happy and to develop well he must believe himself to be worthwhile, valued by adults, accepted by his equals, more effective or wiser than his juniors, and adequate to the demands life makes on him.

The development of self-respect goes on from babyhood and depends on the satisfaction of the other psychological needs. The child who is loved and wanted learns to think of himself as a lovable and valued person. As he becomes aware that his elders and his fellows approve of him for what he can do, he learns to think of himself as a worthy fellow who can do as well as other people. As he satisfies his need to be independent and adventurous, he learns to think of himself as self-reliant and courageous. If he is able to use his various physical and mental abilities to take his place in the school or the family, he learns to think of himself as a competent person. His picture of himself will be largely a reflection of other people's attitudes to him in early life.

It is, therefore, very important for him that parents and teachers should give their approval wisely—not too easily, lest he develop a false opinion of himself; not too sparsely, lest he under-rate himself, think of himself as a failure and of little value, and stop trying.

It is doubtful if any children ever think very clearly about themselves before about seven years of age, and it is often not until 12 or 13, at the beginning of puberty, that they become acutely self-conscious. Up till this time most children have accepted standards from others. But now they begin consciously to search for the standards and values by which they will direct their own behaviour and judge the behaviour of others. This, of course often involves much questioning and comparing. The way in which the religious leader, or the teacher, or the parent says good people should behave may be contrasted with what the children see going on around them and with what they read in the newspaper. Gradually they make up their own minds about how people in general behave, and about what sort of behaviour is satisfactory in life.

If the ideas of the school and the home are too far from the practice of the community, the child may find himself talking one way and acting another. Teachers have to consider what they can do to prevent this state of affairs. One thing they can do is not to give children a sentimental and unreal picture of everyday life but, especially with the older children, to discuss, sometimes, some of the problems that exist all around them. Another is to help the child leave school with a picture of himself as a worthwhile person, one who values his own good behaviour, one who respects himself too much to be mean or dishonest.

Our children can only get this valuation of themselves in their early years from the people they live with and look up to. When children are loved, approved, treated with respect and confidence, they tend to feel that they are lovable, respectable and can be trusted. They are better able to resist the temptations of everyday life to stoop to dishonesty. But if the child is not loved and not approved, not accepted by other children and always treated as if he cannot be trusted, how can he build up a picture of himself as a self-respecting person? And if he does not respect himself why should he bother to keep himself clean, or to be truthful or honest or respect other people?

Of course the child does not think all this out in a logical way, but he acts as if he had done so. Every child wants to be loved and respected and to be able to respect himself. He has to be convinced against his will that he is no good. The child whose basic needs for love and approval are not satisfied spends his mental energy in worrying about his situation, and is likely to try in all sorts of ways to get the attention he needs.

Because the need for self-respect is basic, we should never give up hope when children of any age come to us behaving as though they have none. They may have none, but they want self-respect and it is our job to give them opportunities to get it. In a few cases we may not be able to do much, but usually if even one person approves of a child and appreciates his efforts he will begin to think he may be worth something after all.

The practical bearing of all this is that every school and every class programme should be planned to give all the children opportunities to succeed in some work, to carry some responsibilities, to feel they have a contribution to make. The contribution need not always be great but no child should be left out all the time. It is not too hard to plan for success, and teaching cannot be successful unless that is done. How little some children need, to feel they have a contribution to make, is shown by some children who were clumsy actors but, in a play about people in the desert, they were allowed to be the rocks or trees. They said no words and they never moved, but they were there, they had a part, they felt they were wanted, and they could respect themselves. It might have been easier to leave them out altogether, but it would not have been good education.

CHAPTER FOUR

Principles of Teaching

Principles of teaching are not absolute laws that cannot be changed. They are simply the beliefs or ideas that a person or a group of people use as guides when planning their own teaching, or criticising someone else's teaching, or helping less experienced people to become better teachers. Principles sum up the wisdom of a person or a group of people, but they are not the wisdom of the ages, for that is always changing in one direction or another.

It is necessary, therefore, for every young teacher to look critically at the principles presented to him by older teachers, to ask what they mean in practice, and whether they are in line with aims that have been accepted and with what is known about how children learn. In the end every teacher must work out his own principles and, though he may use the same words as other teachers, when we see what he does we will know what he means by those words.

In this chapter we put forward some ideas for discussion by those who are in the process of working out their own principles. We do not think that the principles suggested here are complete and it may be necessary to set out other principles later as guides to practice in special fields of education. The principles in this chapter are based on our beliefs about the meaning and aims of education, our beliefs about how children learn, our beliefs about how children are motivated, our beliefs about the nature of school subjects (which we will discuss briefly in chapter 5), and our observations of effective teachers at work in classrooms.

1. RESPECT FOR EACH CHILD

We take our first and main principle from our discussion in chapter 1 of the aims of education and the basic values of our society.

This principle has already been formulated in chapter 2, but we repeat it here.

The teacher must respect each child and treat him as an individual whose personal development and fulfilment is an end in itself.

This principle may not, at first sight, seem to give much guidance for classroom practice. But as we discuss other guiding ideas and practical procedures it will, we hope, become clear that every other principle and every method of teaching is to be judged acceptable or not by reference to this one principle. 'Does a principle or procedure respect the nature of the child, or does it place some other value above that?' That is the question we must always ask. It will not always be easy to give a clear answer.

2. ACTIVITY AND EXPERIENCE

When we look for more specific guiding ideas we come at once to the importance of activity and experience. We have already seen, in chapter 2, that children's ideas are rooted in their experience.

Their experience is their active inter-action with their world and the understanding that results from that inter-action. By 'activity' we mean both the physical activity of handling and exploring things and the mental activity of thinking—that is, of searching for connections between old experience and new experience that will make sense to the child and that will satisfy his need to understand and to control his world.

Thinking cannot occur by itself. A child must have something to think about. Children who have few experiences have little to think about. Meaning emerges from experience, from the effort to deal with things and events, and the ability to deal with new experiences or new ideas depends very much on the old experience that children bring to this task. Therefore unless the children bring enough experience to the task of understanding what the teacher talks about, his words must be empty of meaning.

It is the teacher's duty to see that the children do have adequate experience so that they can understand their school work. Often the children bring this experience with them from their daily life, but sometimes their daily life does not provide the experiences they need and then the teacher must provide them. To carry on teaching as if children have experience when they have not, or to cause them to memorise empty words, is to show the utmost lack of respect both for the child and for the subject being taught, for it shows that the teacher does not care whether the child understands or not.

It is no objection to this to say that a child cannot have experience of everything he has to learn. This is true, but the child must have enough experience of his own to be able to appreciate what is said about events outside his experience. At every level in school education, children should be thinking about matters outside their direct experience. At every level they should be getting the new experience that will enable them to widen their ideas.

Teachers who have any doubt of this should note that even such a basic concept as that of weight, which begins with the child's pre-school experiences, must be developed at later stages by weighing—that is, by active experience—as well as by thinking. As soon as a child begins to learn physics or chemistry he is given new experiences with weight, which extend and refine his ideas about weight, and in the end he may come to think of weight quite differently—not as a property of one object, but as a relationship between objects which is sometimes described as the force of gravity.

Teachers, therefore, must help children to get the experiences they need and also to search for the particular meanings of experiences that are important for the learning the teacher has in mind.

The teacher who respects his children knows, of course, that what is a rich and full experience for one child may be only the beginning for another. He will therefore try to help his children to learn and draw meaning from as rich and varied a background of experience as he can. Because he knows they are all different, he will help them to express their thoughts and communicate with each other about their experiences in many different ways. Children need to think over their experience. Their thinking will not be satisfactory unless it is fully expressed, and this may require not only words but also acting or drawing or some other form of expression.

This principle may be formulated quite simply:

The teacher must provide the activity and experience necessary for children to understand what he wants them to learn.

3. VALUE, PURPOSE AND POINT

For the children, meaning emerges from purposeful action. Therefore it is important that every unit of work should be undertaken for real reasons that make sense to the child. Our third principle therefore is:

The teacher must concentrate on the meanings and the values of what he is teaching. He must help the children to see the point and purpose of what they are doing.

Exercises or practices should be carried out for reasons that children can understand and with definite goals in view. It may not be possible for children to see the ultimate ends and values of their school learning, but they should have satisfying and worthwhile immediate goals. They should understand what they do, and what they are required to memorise, at the level that their maturity and experience makes possible.

What this principle attacks is the sort of teaching that pays no attention to reasons for learning, that forgets to bring out the value for the child of what he is taught, that gives no opportunity for the child to do his own thinking, and that results in a minimum of understanding.

Lack of clear purpose is responsible for a great deal of wasted time and wasted effort in schools. This is seen when children are taught 'the four rules' of arithmetic, without any reference to their use in real life. The children, once taught 'how to do it' can add, subtract, multiply or divide correctly—if only they have a sign to tell them which to do. But when they have the same numbers to deal with in a simple problem from real life they are lost. With this sort of teaching arithmetic seems useless. The children come to believe that they can never learn what is, after all, a very simple subject if taught with purpose and understanding, and one that children can enjoy working out for themselves if given a little help.

Children do need lessons on 'how to do it', and they do need drill to make their knowledge secure and to give them facility, but they need purpose and understanding first. If they begin with purpose and understanding, they will continue to enlarge their purposes and to deepen their understanding and to do their drills and practices with more effect, because they can see the point of them.

The basic process of learning is exploration and discovery. The result of learning is understanding—the seeing of relationships or connections, of how to do things and how things work—and understanding is shown by the child's ability to make an intelligent response to the original situation. We can say that learning is effective when the child can use his new understanding in new situations.

It is not suggested that understanding or insight always comes quickly. Sometimes it does—the child who explores a fire or a stinging insect makes his discovery and gets his understanding in a flash. He needs no drill. But more commonly understanding comes slowly, as when a child wants to fit some blocks into holes of the same shape. (See Fig. 1.) He explores, trying each block till he finds where it will fit. He may take some time to discover the right way, and next day he may have to explore all over again, but the process is one of purposeful exploring and discovering. It is not a blind trial and error nor mere repetition. The child has a purpose in mind and he is looking for relationships between the blocks and the holes. When he has grasped the relationships clearly, he gets the blocks in the right holes at the first try and he is able to take his understanding over to another set of blocks and holes and to deal with them

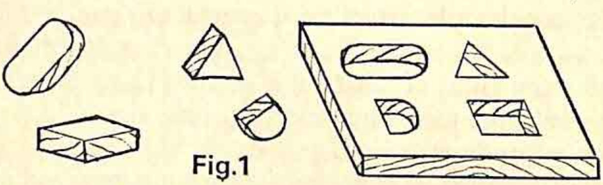


Fig.1

more rapidly. (Of course this is partly because he has grown older and has matured in various ways. But it is also partly because he has developed his learning apparatus, his ability to perceive through his senses, and his understanding of shapes. Learning is seldom confined to the one thing being studied—the child is also learning how to learn and whether or not he likes learning.)

As he grows older, the child will not merely come across relationships in a haphazard way, he will learn to look for them in an orderly way, as an adult would do if he had to select the right key for a Yale lock out of a large bunch of keys.

In each case the pattern is the same—first there is a purpose, then exploration and discovery of relationships, then intelligent response. And always the success of the learning is judged by the response.

Active learning does not even begin until the learner finds himself in a situation that has meaning for him and which demands or invites action—either physical or mental. Therefore to be effective a teacher has to arrange situations that have interest and meaning for the children and that demand exploration and understanding. Then it is the teacher's job to help the learners to explore as intelligently as possible, which means trying to discover what will satisfy their purpose. Obviously the teacher will first have to help the children to grasp clearly what the situation really is and to recognise what they are trying to do, what their purpose is, what question they are trying to answer—it nearly always comes down to finding the right question.

With young children it will often be necessary to make the situation and the question very clear by using pictures or apparatus, for they think best about situations they can see. This will be less necessary as they grow older, but as soon as a situation becomes complicated they will need to make pictures or models of it to help their thinking along.

Here are three examples which emphasise the need to concentrate on the meaning and purpose of what is done, in order that children understand what they should know and how they should go about their work in the most economical and efficient manner.

Example (*a*). The teacher wished the children to learn how to subtract in an example such as 54 —28.

He said: 'We have 54 goats on our farm. We will sell 28 goats. How many goats will we have left? How can we find out? What would we do if we had the goats here in the playground?' The children said they would drive away 28 goats and then count the rest.

'Very good, but how can we find out if we are here in the classroom?' These children knew they must do a subtraction sum. They wrote down the sum correctly, as here:

54 goats
—28 goats
—
—

but they had never before had a smaller number on the top line of the ones column.

To help them to see the exact point of the problem the teacher made them represent the goats with sticks on his big place-value board as in Fig. 2. This showed 54 in the top line.

'What do we have to do?'

'We have to take away 28 goats.'

'Good. Where shall we put them?'

'In the second line.'

These children had small place-value boards in their desks, one for every three children. The teacher said, 'Use your boards. Try to find the best way to do it.'

The children worked in groups. Very soon one group said, 'We have done it.'

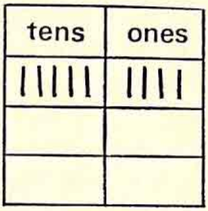


Fig. 2

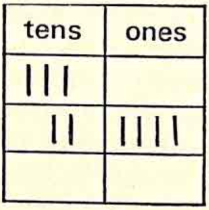


Fig. 3

The teacher said, 'Show us how to do it.'

The children did this: They took 2 tens from the top line, and said: 'That is 20 goats.' Then they took 4 ones and said: 'That is 24 goats.' The board looked like Fig. 3.

'Now what do you do?'

'We need 4 more. So we exchange a ten for 10 ones and put them in the ones column. (See Fig. 4.) Then we take 4 from that and put them in the second line. (See Fig. 5.) Then we have taken 28 goats away.'

'There are 26 left,' said another boy.

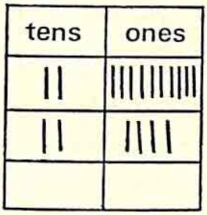


Fig. 4

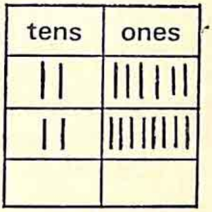


Fig. 5

'That is very good,' said the teacher. 'Now let us do it on the board with numbers. What shall I write?'

Then, directed by the children, he wrote as in Fig. 6.

They said, 'If we take the 2 tens from 5 that leaves 3 tens, so cross out the 5 and write 3. (See Fig. 7.)

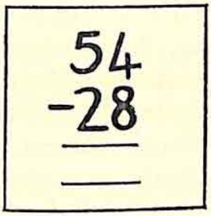


Fig. 6

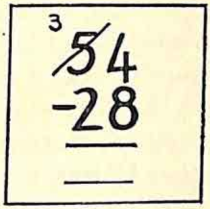


Fig. 7

'Then cross out the 4, because we take that away too. Write a little 4 by the 8 to remind us. (See Fig. 8.)

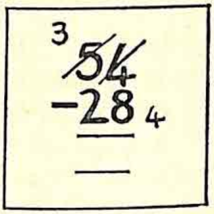


Fig. 8

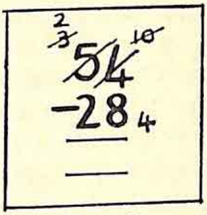


Fig. 9

'Now take 1 ten from the 3 tens. That gives us 2 tens and 10 ones. (See Fig. 9.)

'Now what do we do?' said the teacher to the children.

'Take away 4 ones. That leaves 6 ones. Now the top will have 2 tens and 6 ones. Now we can cross out the little 4 too.'

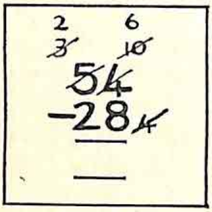


Fig. 10

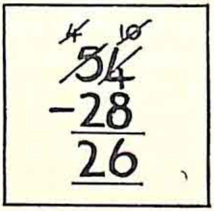


Fig. 11

'What is the answer?'

'It is 26 goats,' said the children.

Although our illustrations show five blackboard pictures, these were really only stages in building up Fig. 10 from Fig. 6.

The children had used figures to show exactly what they had done with the place-value board.

Now the teacher said, 'Why did we have to have so many figures?'

'To show that we changed the tens. So that we could take away 8. You can't take 8 from a little number like 4.'

'That is good and you are very clever,' said the teacher. 'Now let us see if we can begin with the ones instead of the tens.'

Because the children were quite at home with the place-value board and knew how to exchange tens and ones, they soon thought their way through this, and discovered the usual way.

The teacher asked questions to direct them so that they always knew what they were looking for.

How did he get the answer at the bottom? He wrote the sum high up on the board so there was no room above. Then, when he crossed out the 4 tens and the 10 ones, he said, 'No room there. Where shall I write it?' A girl said, 'You could write it underneath like other take-away sums.' (See Fig. 11.)

Then the teacher went over the sum again, but this time he said, 'We could just put down a little 1 by the 4, as long as we remember it means 1 ten. It is really like 14, isn't it?'

In this way, step by step, the children were helped to discover the process of decomposition in subtraction, and the short way in which we set it out. Because they had discovered it they understood it. Each active step, however, was thought out to deal with a specific point. The principle of purpose was followed throughout in order to direct the children's minds.

If, on reading this for the first time, you do not follow it easily, we suggest you work through it with your friends in groups of three, using first a place-value board and then a blackboard. Discuss each point. This will help you to see the value of these principles, especially those that come next in this chapter.

Example (*b*). In teaching children how to address an envelope the teacher begins with a letter that needs to be written and delivered, such as a letter to a sick child or to a school in another village. The questions then are: How shall we address it? What is the address for? Who will read it? What will he need to know? That is, what is the purpose of the address?

When the children have found satisfactory answers to those questions, the teacher may show them real letters that have come to the school. Sometimes he may be able to persuade a postman to come in and explain his difficulties with poor addresses—and look at the addresses they have written on the envelopes they will send.

This teacher emphasises the purpose and value of a clear and logical address on every letter.

Example (*c*). In history, when studying an explorer's journey, the teacher may tell the story as a good story, but his questions should give point and purpose to the children's thinking. For instance, they might write their notes as answers to the questions, after discussion.

Why did he make the journey? What sort of man would make such a journey? What was he looking for? Why did he want to know? Why was the journey so slow? What did the local people think in the places he passed through? Questions such as these organise children's thoughts around the important points of their study. Other questions such as: How can we best show what he did? may draw attention to the use of other subjects in the study of this one, for in this case part of the answer may come from children's study of maps in geography, and part may come from studies in arithmetic—diagrams of distance and area.

The importance of the question in establishing purpose and stimulating mental activity in children is, in these examples, shown to be greater than its importance for testing knowledge which is its all-too-common use.

In health lessons, the teacher could ask, 'Are more people sick in our days or when grandfather was a boy? Why were more people sick then? What do we do today to prevent sickness?'

These beginning questions immediately give purpose and arouse active interest. Once the children have grasped the main theme or question of a unit of study, they can be asked what it is necessary to find out in order to answer the question or fill out the theme, and also how it may be possible to find out, and thus build up a plan of study. The older children can do this for a much larger unit of work than the younger children, but at every level of the school if the children share in the planning they will be much clearer about what they are trying to do.

In cases where the children need to become better at a skill, they need to discuss the standards by which the skill is judged, so that they will know what 'better' means. Such a discussion should bring out the purpose of the skill and lead to the judgement of quality by relating the skill to its purpose. Thus in handwriting the teacher may ask, 'What is handwriting for?' And the answers will be that it is to convey a message and to record thoughts. It is for a person to write down what he thinks. It is so that someone can read it, and so on. 'Well then, what sort of handwriting is best to record thoughts? What is best to read?'

By discussing these questions and looking at each other's handwriting, the children can easily be led to see that legibility comes first. Then they can look to see why their own writing is not legible and they will know what to try to improve. Older children may add other desirable qualities such as speed of production.

In some subjects the purpose in view cannot be achieved without practice or drill. But practice and drill are not starting points in a study. They should be given at the point where they will be most effective.

Practice will be most effective when the children have a degree of understanding and want to make it secure before they go further. A child practises a new exercise until he gets it right. He practises the shape of a letter or the pronunciation of a word until he is satisfied he has control of it. He is then in a position to drill for facility. Understanding usually increases during practice.

Drill, too, is purposeful, but its purpose is not more understanding but more facility. (Although we use 'drill and practice' in this way in this book, students will usually find 'practice' and 'drill' used with no difference in meaning.)

Practice should be carried out at the child's own chosen speed, without pressure to hurry on. Drill should be carried out briskly and when possible against a time limit.

Practice may be carried out in many forms. Thus a child who is getting control of the multiplication facts may practise writing them down in table form, for this will help him to see them in a meaningful pattern and give him a means of reconstructing or finding again a fact that has escaped his memory.

Drill should be carried out in the form in which the material will be used. Thus multiplication facts will be drilled by requiring a response to questions in random order (see chapter 6, page 161), because that is how these facts are needed, and to drill the tables would put a brake on automatic recall of the one needed fact at any moment.

Whenever possible, the improvement in speed should be measured and recorded. After a period of drill the children should always, though quickly, consider the results of the drill: Are we better than yesterday? What was our best point? What do we need to concentrate on tomorrow? They thus establish their next goal.

As children grow older they should have a larger share in deciding what they drill, how they drill, and how they measure their results.

4. AND 5. INDIVIDUAL LEARNING AND SHARED LEARNING

We will discuss principles 4 and 5 together for, although they seem to contradict each other, in reality they support each other.

Principle 4 is:

Children must be helped and encouraged to explore, to think and to learn in their own way.

It emphasises the differences in children—which must be respected and used by the teacher.

Principle 5 is:

Children must be helped and encouraged to share their experiences, their thinking and their learning.

It emphasises the social nature of human beings and of human development. Children cannot develop well unless they have plenty of social experience. Their basic needs cannot be satisfied unless they have opportunities to work with others *and* to work in their own way. Working in groups on a common problem or practising with a common purpose stimulates each child, supports him in his own efforts, and enables him to learn from others.

When the teacher provides a learning situation, each child is likely to see in that situation something different. For example, a teacher may provide such a learning situation as a visit to a river. The teacher's purpose is to teach his children to swim, but to some of his children the situation may appear as:

(a) a threat—that they will be forced into the water of which they are afraid;

(b) an invitation to bathe in the shallow pools;

(c) a challenge to swim right across;

(d) a hope of a chance to fish;

(e) a chance to find some water creatures mentioned in nature study;

(f) an opportunity to collect materials for basket making;

(g) an idea for a dance with music;

(h) a chance to look at the work of a river, which they studied in geography.

The teacher may be interested in all of these different responses to the situation but his first interest in this case is in physical education. He wants all the children to learn to swim well and to enjoy swimming. What must he do? Obviously he cannot simply explain how to swim and then order everyone to jump into deep water and swim across. This sort of teaching may seem to be possible in arithmetic in a classroom, but at the river even the most authoritarian and traditional teacher can see that it may be fatal.

To be successful the teacher must not only provide the situation, he must also help the children to take advantage of it, *each in his own way, each taking that step towards becoming a good swimmer that is the next step for that child.* And obviously, too, some children will be helped by doing this in the company of others who give them confidence, challenge them, and show them what to do, while some must make their first approaches alone and in their own way. The teacher must not force timid children into water up to their necks, but must allow them to go quietly into shallow water, up to their knees, until experience gives them confidence to move in deeper.

A group of timid children may play together in the shallows and the teacher may suggest a game: Who can hold his face under while he counts to five? To push a child's face under may destroy his confidence altogether. But let him do it in his own way and confidence will grow. Usually the individual children will quite naturally go into their own groups and will change from shallow water to deeper water as they feel able to do so, though this may take several visits to the river.

The teacher will have to spend much of his time looking after those who can already swim, and he will have to look at each one separately in order to help him. Each swimmer has his own way of moving hands and feet and must be taught to correct his own faults. He will work hard at his individual problem once he understands what he has to do and why it will help, but the presence of other children to practise with is an encouragement. The presence of better swimmers is a stimulus.

The older children feel responsible for the younger and learn to be sensible by telling others not to be foolish. Those who are just learning tell each other what to do and show what they can do themselves. The timid children make more progress by encouraging each other than they would do under strict orders, and they enjoy what they are doing.

Each child looks at what his friends can do. From those who are better he gets inspiration—new goals to aim at. The slow swimmer may wish he were much faster but his immediate goal will be to equal a boy who is just a little faster.

In this situation, within a large group that provides inspiration, encouragement and ideas for everyone, there will be smaller groups in which each child can have the experiences he needs and can learn both from others and in his own way.

Anyone who thinks over such a situation can see that all the principles of teaching are at work here. Most of a child's psychological needs can be satisfied if the teacher goes about his work in the right way—but if he neglects the principles some of the basic needs will suffer and the children will not be able to learn well.

Much traditional teaching is carried on in defiance of both these principles. On the one hand, each child, though sitting in the class, is forbidden to help his neighbour and is forced to act as though co-operative effort were a crime. On the other hand, the teacher tries to make his children act as though each were exactly the same as every other one. They must all write in the same style, work at the same rate, do their arithmetic by the standard pattern of the class, or be told they are wrong.

Modern teaching has nothing to do with this unpractical refusal to face the following facts:

1. If children are to work well and learn well, they must work in the ways that are natural to them. For example, some do better in learning spelling if they can see what they have to learn. Some find it a help to say each letter out loud. Some learn better if they pronounce each syllable carefully as they look at it. Some must write the word a few times in order to remember the spelling. Most need to see, say, hear and write the word, syllable by syllable. But there is no one right way. If every child were made to use all methods, the result for a partly deaf child might be poorer learning, because his attention to the shape of the letters would be disturbed by straining to hear the sound of the word.

2. If children are to get enough insight into their school work to feel at home in it, they must learn much of that work in groups, helping each other.

3. If children are to get enough practice or drill, they must work in groups, drilling and testing each other. In English, for example, there is simply no other way of giving children enough practice with new words and new sentence forms than by letting them practise in groups of two or three. Often the groups must change, so that each child says the sentence with new meaning many times to many children. For example, to ask the question 'What is your name?' thirty times to one child is not nearly so effective as to ask it once to each of thirty children.

4. Learning must often be carried on in groups within which children work in individual ways. For example, practice in explaining how to go somewhere or do something is best done in small groups, where each child explains in his own way and the others can listen and question according to their understanding. In creative dancing two children respond to each other's movements each in his own way—but this cannot be done alone. In such cases each child learns for himself, but he cannot learn alone.

5. Although in evaluation it is always the individual learner whose achievement is being measured, and although testing is traditionally carried out with each individual carefully isolated, even this isolation is not always possible. Sometimes even for testing a group is needed. For example, to test ability in spoken English there must be at least two speakers, to test ability in a sport such as wrestling there must be at least two people, and in football many more.

In any school there is a place for individual work, and a place for group work. At present schools seldom give group work a large enough place.

Getting to know Children

In order to help children work in their own way it is necessary for the teacher to study them sympathetically with such questions in mind as: How does this child think? Does he think in pictures, always needing a drawing of something to help him? Or does he seem to think in words? Does he seem to jump suddenly to the understanding of problems or does he work them out slowly and logically? Is he disturbed by working close to other children, or does he seem to need a group of others around to keep him happy and working? Does he have to write down every step in a sum or every idea as it comes, or can he carry ideas in his head? What is he interested in? Is it mainly people or animals, or one special pet animal? Or is it machines, or his father's farm? What hinders his learning? Is he easily distracted by noise or movement round about? Is he easily upset by a sharp word? Is he hungry for praise? Is he unsure of himself or too sure of himself? Can he get ideas from books? Does he think about what he reads?

In large classes it is not possible to make a very detailed study of every child and probably it is not necessary to do so. But the teacher should try to know and notice every child well enough to give special help to those who specially need it.

Quite often, after all, the special help needed is in only one small subject. Quite often it is no more than being noticed and feeling that someone cares about his work. Quite often it is no more than being taken to the medical officer, or put at the front of the class where it is easier to see and hear. Sometimes it is only a word to the parent that the child needs more sleep, or the assurance to the parent that the child is doing as well as his natural ability makes possible. There are many ways in which different children may be helped. But before a teacher can help a child he must notice him and know something of him.

Because children grow and change so quickly, the process of getting to know them is a continuous one. Many teachers do not feel any need to make a special effort to know their children. This may be because they are so sensitive to other people that they are always aware of their children's changing moods and needs. But most of us are not as sensitive as this and need to take care that no child slips unnoticed through our class.

Here are some simple procedures used by teachers who felt keenly the need to know their children better. (Look back on your own schooling and think whether these would have helped you and your schoolfellows.)

(a) This teacher suddenly realised that he did not even speak to some children on some days. He arranged to greet each child individually every morning when he came to school and to say goodbye to each child every afternoon. He tried to think of something personal to say to each child in the afternoon if he had not done so during the day. This made him look at every child more carefully, not just those who were very clever or very naughty. He soon found he had fewer problems with discipline and all the children came to think of themselves as his friends.

(b) Another teacher spoke to every child in his class every day and he checked himself on a class list to make quite sure he did so. He tried to find something in each child's work to commend every day, and he looked for some point in each child's work where he could help—sometimes a little point about neatness, sometimes a suggestion to use a picture or a way to improve spelling or punctuation or speech. These points were never made as criticisms.

(c) A third teacher sat down after school or before school each day for a few minutes and tried to picture in his mind each of four children—their appearance and their clothes, their work, their behaviour, their interests, their strengths and their weaknesses. Sometimes he found he knew almost nothing about a child. Then he took care to observe that child carefully, to look at his books and to see whether he needed help in his work and whether he had any friends in the class. He had to discipline himself to do this because he found it was not easy. But when he had been through the class register only once he found he knew so much more about the children, and he was teaching so much better, that he continued.

These are simple but good ways in which any teacher can train himself to be more sensitive to his children, but in addition it will be necessary to use more formal methods to check on the work in some subjects. (See Principle 7, Evaluation, on page 77.)

Teaching Children to work in groups

Children have to learn to work in groups and teachers have to learn how to help them. This learning will not be done all in one day but will go on year by year, in just the same way as children learn to work for long periods alone. Teachers who are accustomed to silent classes where the children have no share in directing the work will have to think hard and be patient, because they themselves have to learn what is best done in a group and how a group can work.

First it is necessary for the teacher to think carefully what happens in adult groups and to understand the advantages of group work. Then he may be able to work with confidence because he will know what he is aiming at, what to expect, and how to judge success.

You should, therefore, begin by observing how adults work in a market, on a farm, or on the wharf, and how they behave at social gatherings and whenever a number are gathered together in one small group, one large group, or many small groups. Then you may discuss what you see. When you discuss with your friends, do you get most out of discussing in a small group or a large one? Is it a good idea to discuss first in small groups and then report back? Why?

Is it easier to set out on a task if you have company? Suppose you are going to make a special study of a subject, do you prefer to do it alone or is it better to have someone to work with? Is it true that the sight of people around you all working hard tends to make you do the same? If there is interest in a musical instrument, or a discussion on a scientific experiment, or an argument between two colleagues on how to set out a sum, do you tend to become interested, and take part? Do you listen and weigh up the different arguments?

If there is a discussion, how do you get the meaning of a fellow student's words most easily—when you can see his back only, or when you can see his face, or when he is behind you and you cannot see him at all?

In a crowded market, or a crowded commonroom or staff room, is there usually much noise? Stop and look at the people—do they hear the noise? Does it interfere with their thinking? How much noise must there be before it is noticed?

Think, now, of your own work. When there is a class project what produces the best morale—the project being planned by the teacher alone or by the students alone, or by students and teacher together? Which helps you most: reading a book alone and remembering what it says; reading and arguing the points raised by fellow students; explaining to someone who is interested?

There is no need to make up your mind once and for all on these questions, but if you discuss them you will have a better idea of the possibilities of doing group work even in a class of forty children, and of the value of working in groups.

Next consider the way children think and the way they learn, and, if you can, observe them working in groups and alone. You might carry out a small experiment like this. Provide a problem that is new to some children, such as how to do long multiplication. Set some of the children to work by themselves on the problem, giving them no instructions. Tell others that this is a new kind of sum and you want them to find out how to do it. You can tell them some other children in another school found out how to do it. (This is quite true.) In this way you provide a purpose and a challenge different from the first group. Divide this second lot of children: some are to work alone, others in groups of two, three, six.

Observe what happens. Who get down to work first? Who give up first? Who think hardest? Does the big group have trouble just because of size? Do the groups find their own leaders? Do some groups really start to work as individuals? Do the groups interfere with each other?

If any of the children find solutions, you may ask questions about how they came to do so. But let *them* explain to the class, and observe who seem more interested, group workers or individual workers.

Finally, when playtime comes, does the interest continue in the playground? If there is something to be said in favour of both methods, what seems to be the advantage of each?

When children begin to work in groups they need two kinds of help.

First, they need to know the purpose of what they are doing very clearly. Sometimes the purpose for the children may actually be to work out what the next step in a task should be;

sometimes it may be to find the meaning of a map or a story or a picture. Whatever it is, the teacher should be quite sure the children understand what they are to do.

They also need to know what to do when they have achieved the purpose. For example, when one of the groups above has found how to get the answer of its long multiplication sum, what does it do? The group should know that it must then report to the teacher, and he must know how to proceed. The children, having gone as far as they can with the group-task, must not be left without instructions or they will begin to fill in time with talk about other things. The result will be noise, a disturbance of other groups, and possibly a feeling on the part of the teacher that group work wastes time. In this case the teacher should have ready some more problems, so that they can test their method to see if it works in different cases. Then he may ask them to prepare to explain their methods to other children by setting it out on the blackboard, and so on, so that they are never left with nothing to do.

Second, children need to know *how* to work in groups. This may be complicated in many ways but the first thing the children need to know about is the need to keep the noise down. (Discuss the point, and ask the children to use 'group voices' which means speaking quietly, but not whispering. Whispering is a strain and is not effective for discussion.) The second thing is that if there is a group leader his main job is to ask the others in turn what they think, not to do all the talking himself. It takes time for children to learn the duties of a group leader and to learn to discuss things in a constructive way, but this is one of the things in which group work provides practice. Finally, the children have to learn to report back the opinions or findings of the group when this is necessary.

As far as possible the teacher should let small groups work in their own way, but he must be alert to help when necessary.

Probably the most obvious justifications for group work are:

1. The stimulation to better thinking. We have already suggested that children's thinking begins with manipulating objects and goes on to manipulating images and symbols, and from attention to *what* happens to an interest in *why* things

happen. The more difficult the thinking the more likely are the children to fall back on objects, or diagrams, or written symbols to support their thinking.

On the other hand, the more children are stimulated by questions, or the presence and attention of friends, the more likely are they to talk aloud and to explain, to give reasons for what they observe, or what they believe, or what they propose to do. We usually regard reasoning about reasons, or explaining relationships, as a higher level of intellectual activity than merely carrying out operations. It requires a greater effort of intelligence to explain how a bicycle works and why it can be ridden than it does to ride it. A mere machine can do all the operations of arithmetic, but only a thinking person can explain why the processes work, or can discover them in the first place.

In the group situation the children, faced with the doubts and questions of their fellows, are forced to explain their thoughts clearly and so to become more thoughtful people.

2. The possibility of more effective practice. In practising sentence forms, or drilling number combinations, or practising the reading of maps, or physical exercises, children working in pairs often get more practice and more effective immediate correction of errors, leading to more effective practice, than if they work either singly or as a class.

There are times when it is best to work as a class (the largest group), as small groups, and as individuals; and we should not neglect any of these but use whichever is the most useful for the particular purpose in view.

3. The carrying out of projects that are too large for one person. Where it is necessary to collect a large mass of information, as when studying a community in geography, group work is needed. The children can work in pairs to count the number of houses, men, women, children, farmers, bicycles, etc., etc. in their street or district. They may then work in larger groups to make a useful map and a useful description, using the total information collected. In dancing, music, and some other subjects, of course, the work is usually conceived in large group terms, but better work might often be done if there were some opportunity for individual or small-group work.

4. The satisfaction of the basic needs. Of course each of the justifications given above can be valid only if it satisfies one or more basic needs, but students should read again the pages on basic needs and think how they can be satisfied best by group work, and whether there are any that cannot be satisfied except by group work.

How, then, should groups be selected? The only possible answer is that the teacher must select groups according to the purpose he has in mind and his knowledge of his children. Sometimes he may allow the children to choose their own groups. Sometimes it is convenient to have children in two or three groups of about the same level of ability. But quite often the level of ability is of little importance and the children, both quick and slow, get more from working with others different from themselves.

What the teacher has to decide is what he hopes to achieve by putting the children in groups on any particular occasion. Then he will arrange the sizes and sorts of groups to suit the occasion.

6. TEACHING SHOULD PROCEED IN AN EDUCATIONALLY LOGICAL ORDER

By an educationally logical order we mean an order in which *the children* see sense in every step as it comes, from which more meaning emerges as each step is taken, and which leads to further development of skill or understanding, or attitude.

If the children cannot see much point or purpose in a school activity, they cannot enter into it with all their powers, and therefore the work is being presented in the wrong way or at the wrong stage in the children's development.

There are always several possible ways of attempting to teach a topic, and usually several possible ways of performing any task, such as writing a poem or doing a sum, and the teachers have to decide which they will take. For example, in subtraction we have the choice of the method of *decomposition* or the method of *equal additions*, or *both*. And we may attempt to teach both at once, or one only, or first one and the other some time later.

What should we do? How should we make our choice?

The most common opinions on this particular question are:

(a) 'Teach only one method, because two methods will confuse the children.'

(b) 'Teach decomposition, because children can understand it—it makes sense to them.'

(c) 'Teach equal additions. It is the most efficient. The children do not understand it, but it works.'

(d) 'Teach both, for both have merits. Teach first decomposition for early understanding and, much later, teach equal additions to extend understanding.'

On these our comments are: First, we certainly should not confuse the children, so it will be best to teach only *one method at a time*. Second, opinion (b) above is quite right as far as it goes. The children not only understand this method, they can discover it for themselves, and we know of classes where more than half the children have done so. Third, there is no conclusive evidence that either method is more efficient for children or for adults. The children can learn to use equal additions by rote at about eight years of age, but they can seldom be taught to understand it before nine or ten years of age. We have never known a child discover this method for himself. But the method does make use of mathematical understanding all children should have. Fourth, we therefore like opinion (d) best, though with this explanation: when, perhaps two years later, the method of equal additions has been taught to extend the children's understanding of subtraction, each child should be allowed to carry on with whichever method appeals to him. If this is done, arithmetic will have more meaning and the children will be helped to become more open-minded and flexible in their approach to arithmetic, and to thinking in general.

We further comment that confusion is the result of failure to understand and failure to give proper practice, not of learning two methods. A small piece of evidence for this, which students may check for themselves, is that nearly all teachers who teach equal additions for whole numbers, teach the same children to use decomposition for subtraction of fractions. They do not even know they have done it, but the children are not confused.

If the teaching of school subjects is to proceed in an educationally logical order it must follow the natural order of learning. This begins with seeing point in doing something and sense in the way it is done. Children cannot make much progress unless they can see what they are making progress towards.

In arithmetic most teachers make an effort to make the purpose of each lesson clear. The line of progress may not be entirely educationally desirable, but children can see something to aim at in a process or a table—and they do move forward. In some other subjects neither teachers nor children are always clear what they are aiming at or why the exercises they set have value.

In the mother tongue, for example, many children make little or no progress after they are ten years old. This is because the teacher does not concentrate their attention on a purpose in which they can see much sense. Nor does he judge their work by standards that seem to have much importance. The use of language is to communicate thoughts and feelings. Therefore the children should be learning to think more clearly and to communicate more effectively. But what does 'more effectively' mean? It is not enough for the teacher simply to urge the children to do better work.* She must help them to understand what better work is, and they must be able to see sense in the standards she tries to use.

Children who can see that statements are more effective if they are brief, can try to save words. They can be helped to test each other's work for clarity. They can be helped to see when they are reporting accurately, and when they are making statements in order of importance. They can appreciate the effects of suitable figures of speech. In all these they can be helped to improve because they can understand what they are aiming at and can, to some extent, judge their success.

The only alternative to a sequence of teaching based on the order in which children can discover, understand, or appreciate a developing subject is learning without understanding, which is known as parrot learning; and is practice without purpose, or with purposes that lie outside the work itself, as when one tries to memorise a poem to escape the teacher's anger. But purposes that lie outside the work can rarely be justified. It is always better for children to do the right things for the right reasons, and to judge the value of work done by standards they can understand and accept.

---

* See also pages 60 and 79.

The pattern of developing skill is from the undirected and vague movement of the baby, who is finding out what he can do by doing all he can, to the precise movements of the skilled adult who knows exactly what he wants to do and does it by the most economical and effective way possible. The pattern of developing meaning is from the young baby's purposeless and uncontrolled exploration of his world and of his body (in which he forms his first ideas from physical impressions, and in which he develops his first purposes) to the carefully controlled and purposeful exploration of the scientist who uses physical experiments to check his ideas.

In the early stages of every subject we begin with immediate and concrete experiences that have no meanings beyond themselves. But as we advance through the subject, relationships between the experiences begin to appear, and in the end it is the relationships with other fields of learning that become most important.

The danger in the early stages is of hurrying too quickly from the first-hand experiences around which children are fumbling for understanding to the systematic arrangement of abstract ideas and the economical processes that adults take for granted in reading, arithmetic, and other school subjects. The beginner nearly always has too little experience and too little intellectual maturity to appreciate the shortened thinking of adults who have mastered a subject and then reduced it to a system.

The beginner therefore falls back on the memorising of empty phrases and of formulae that are not the application of understanding, but the resort of those who do not understand. A good example is the 'borrow and pay back' pattern that some teachers still use to accompany subtraction by equal additions where it is complete nonsense. (In decomposition there is some excuse for the 'borrow' but none for the 'pay back'!) Another example is that learning of dates and events without appreciation of sequence, connection or importance that is sometimes called 'history'.

We have said he 'falls back', but it is not so much the child as the teacher who falls back on these empty pretences at learning. There are two major causes for this. One is the fact that teachers themselves have been through an education that did not encourage independent thinking. The other is the practice of testing throughout the school those things that can be remembered, and neglecting to test or evaluate in any recorded way improvements in understanding, or in ability to attack new work.

Behind the idea of an educationally logical order in teaching is the idea that *growth is continuous*, and that the school helps children to develop their thinking along a number of lines which are distinguishable for teaching purposes, but are really parts of one broad stream of development. There is, for example, the development of quantitative thinking, centred around arithmetic, of objective thinking, centred round science, of social awareness, centred round history and geography, and of the ability to express and communicate, centred mainly on language, but also on all the arts.

This idea of lines of development implies that the purpose of subject teaching is to help the pupil become a person who thinks and acts in certain ways, and not merely one who can reproduce certain facts when asked and can perform certain operations when given the command.

The child who learns science should be becoming a little scientist, in the sense that he applies a scientific attitude to the whole of his problems. The child who learns arithmetic should be learning to apply quantitative thinking wherever it is appropriate—to ask such questions as: How much exactly? What proportion? and not to be satisfied with vague answers. The child who studies literature should be learning to like literature and to be a poet and a critic, in however small a way, not merely a reader of a few books. The child who learns to read should not be merely learning to pronounce written words, or even to gather thoughts, but to think about those thoughts created by the words read.

And so with all subjects—the educationally logical order is the order that makes for understanding and that brings the knowledge and skill developed in one subject to bear on the problems of other subjects, and of life in general.

7. EVALUATION

Evaluation involves the teacher and the children in two ways: (a) in looking back to see what progress has been made, and whether what was done was worth doing; (b) in looking at the present situation to see what ought to be done next. It may be simply to carry on; it may be to do some diagnostic testing or some remedial work with one or two children; it may be to teach some topic again, or to look again at the goals set up for some unit of work because they have been found too hard, or too easy, or not, after all, what was needed.

The principle of evaluation emphasises the need to take stock of progress and of difficulties and to look again and again at aims and methods.

In schools, evaluation begins with the setting up of aims and goals by teachers and children. These may be modified or completely changed as evaluation of them goes on during the year, but in the meantime they become the standards by which success is judged. As the children work towards their goals, the teacher continually observes and records their progress. If he finds that some children are not doing as well as he thinks they should, he will try to diagnose their difficulties and to re-shape his teaching accordingly.

The result of all this, for teachers who have an effective evaluation procedure, is that they do not go blindly ahead with their teaching, leaving some children behind. They gather up the difficulties and deal with them before the children have become discouraged. This procedure will certainly result in a certain amount of small-group teaching in subjects where advance is closely related to new processes and new knowledge, as in arithmetic and is not so much a matter of personal expression as in the arts, or of depth of understanding, as in history.

•

There are many school subjects in which the teacher presents the one lesson to the whole class but the children learn at different levels according to their ability, for example, singing, writing stories, physical education and art and craft. This may not be the best thing in the world for either the fast or the slow learners, but it is not too bad. But in arithmetic, reading, and the learning of a second language, the teacher's instruction and the children's work must be closely geared to the children's ability, and to their facility in the subject. It is no good teaching a child a new process until he can handle the last one. It is no use advancing to difficult books in reading until the children can read easy ones.

There are two temptations in this connection to which inexperienced teachers sometimes fall. One is to spend too much time in testing and not enough in teaching. The other is trying to bring all children to the same level. This means neglecting the very bright and even the middle range of children in favour of the slow. The slow must get their share of the teacher's time, but a reasonable aim is to have each child, or group of children, advancing at a reasonable rate according to their ability. A class where the level of achievement is uniform is a badly taught class in which the bright children are all backward.

An effective evaluation procedure requires three things from the teacher.

First, he must be sensitive and alert to children's attitudes to their work as he moves about the class, so that he knows where to give help as soon as the need arises.

Some of the ways in which a teacher can help himself to become more sensitive to his children are mentioned under Principles 4 and 5 (see page 65). In addition, teachers should try to become acquainted with the parents of their pupils and to meet them at least once a term.

Second, the teacher must help his children to evaluate their own learning. Children will attempt to do this in any case, but they must be helped to develop reasonable standards and to set themselves goals that are neither too hard nor too easy. The teacher's task, therefore, is to help all children to see very clearly what they are aiming at and what their immediate task is, and then to make sure that they make progress and that *they can see they are making progress.*

The common difficulty here is the teacher's use of vague words. The teacher urges his children to do 'better' work, but he does not explain what 'better' work is. 'Better' should not mean something that pleases the teacher, or that has no common mistakes. 'Better' should mean an improvement in some positive and well-understood and accepted way. To speak 'better' may mean to speak more clearly, but even if the teacher explains this he may not give a genuine aim to the children because most of them already believe they speak perfectly clearly. The teacher's problem is to show them that they do need to improve, and this is one of the most difficult little problems that teachers meet. To write a 'better' story may mean to write one that others will want to read, or to write one that has more details in it, or something else. But 'better', by itself, carries no meaning at all. Only if the children have some standards to judge their work by can they evaluate it properly. Usually the teacher will have to discuss the improvement of their work with the children. When they have discussed it they may understand what they have to aim at next.

This will mean, of course, that teachers themselves must make sincere efforts to emphasise genuinely important qualities in work and not to allow either the easily examinable or the merely pretty to take first place. In a nature note-book, for example, it is the accuracy of the observations, not the neatness of the handwriting, that is of value. Neatness is of quite secondary importance. In handwriting it is legibility that is most important, ease of writing is second, and only after that comes attractive appearance.

The children will expect to get their standards from the teacher. If he does not put first things first, neither will they. In this matter, as in so many others, what the teacher does will have influence, and he must be careful not to mislead the children by saying one thing and doing another—by saying, for example, that understanding is important in arithmetic and then marking strictly on mechanical accuracy.

Third, the teacher must build up a set of records that will help him to keep a check on children's strengths and weaknesses. The most important things to note in such records are *failures to understand* and *failures to memorise*, those things *which will hold up future learning.*

These failures are usually part failures and therefore easily missed. They must be looked for in actual performance rather than in tests. A child who can explain a meaning or a process but cannot use it does not understand it in practice. A child who can spell a word in a test but not in his ordinary writing has not learned to spell it. A child who can pronounce a word or repeat a phrase of his second language correctly, but does not do so in ordinary conversation, has not learned it. Between the test and the daily performance a teacher may realise just what the child can do and what he has to learn—but he must make records or he will forget. Making records teaches nothing to a child, but it should teach something to the teacher, and unless it is done many children will be much more backward than they should be.

Check Lists

In some subjects a useful aid to day by day evaluation of progress is a check list or a series of check lists which can be used with a record book. Such a list may be made up when studying the course of work for the year, using the text book, expecially the teacher's manual, if there is one, and the syllabus of work, as a base. Teachers will select what they think important, and they will make lists to cover sections of work of a size they find convenient. Here is a list made up by a teacher of an infant class:

Check list for Beginners, Primary 1: Understanding of Number

1. Can classify objects by size
   by colour.
2. Can match patterns on one card with patterns on another card.
3. Uses words to compare things (big, bigger, small, the same as, not enough, etc.)

4. Can sort and place wooden shapes (circle, half circle, square, etc.)
5. Can arrange blocks, tins, etc. in order of size.
6. Can match patterns with blocks, one block to one dot.
7. Can count by rote to..........
8. Knows number names for groups up to..........
9. Understands: First, second, third..............
10. Recognises numbers up to...........

In primary 4 children may be using this check list:

Primary 4: Multiplication List No. 1.

1. Understands multiplication as a quick way of adding equal amounts.
2. Understands multiplication as the opposite of division.
3. Uses correctly: multiplier, product, factor.
4. Understands that 3 × 4 equals 4 × 3.
5. Understands that 24 × 23 equals 24 × 20 plus 24 × 3.
6. Can build up a new table for himself, e.g. 16 ×.
7. Knows all tables up to 12 × 12.
   Has difficulty with: (7 × 9, tables over 100, etc.)
8. Understands the use of zero as a place holder.
9. Can explain why 4 × 0 equals 0.
10. Can choose multiplication correctly to work out one step problems.
11. Can make up suitable number problems to fit examples like 7 × 45.
12. Can estimate for examples like: 9 × 73 (as less than 730).
13. Can prove multiplication by division.
14. Speed on class test is (fast, average, slow).

When recording observations, teachers should note only what needs attention, thus:

Date Johnny Ndi: 1967.
18/4 List No. 1. Not clear on 4, 5. Doubtful on 9.
Usually right on 12. Unsure, tables above 40.
esp. 7× and 9×. Low average on 14.
18/5 List No. 1. All okay except tables over 100, and slow in 14.

These entries show that John is improving in understanding, but he is in need of constant practice on tables and mechanical work or he loses speed. He is now dropping back in the class in speed. (Teacher's question: Is something wrong with John—why should he drop back?) Note that this does not mean John is slower than at the first test but that other children have improved more in speed (Point 14). A check list such as List No. 1 needs to be supported by two or three sets of tests of multiplication each with a range of common difficulties, which can be used as a diagnostic test at first, and then as a speed test. When the children seem to have mastered all the difficulties of multiplication and are trying to work faster, the use of the diagnostic test as a speed test sometimes shows up lingering doubts in children's minds.

There should also be a test of problems that require multiplication. This may include some examples where the child has to select the right process from several examples, or select the one example that requires multiplication.

A set of checks and tests like this must be used in a sensible way and not too often. But unless it is used the teacher will not be sure of what his children can do or of what they understand, and he may even forget to teach them some of the items on the list.

Written out in a slightly different form the check list can be given to children to test themselves. They can work in small teams and help to bring each other up to standard.

In some other subjects, such as history, geography, natural science, the teacher and children together should set up the goals they hope to achieve by a certain study. They should then use these goals to evaluate their success. The teacher will add to the children's aims some that he knows of, but which they cannot be expected to think of. At the end, when the class looks back to see what it has achieved, the teacher should always ask if they have learned anything beyond what they set out to learn.

This is often a suitable time to make children more aware that they are learning how to work together, and that in one subject they may learn a good deal about the use or the meaning of another subject. They may find out in *geography*, for example, that to make a survey of the market activities, sources of products, and means of transporting products in their community, they may all have to work as individuals or in pairs to collect information. Then they work as a class to put all their information together. Then they use *arithmetic* to find the totals, the averages, the minima and maxima of production, and make graphs to represent these. And perhaps, if they make a very complete study, they may compare it with graphs of rainfall in their district, to see if there appears to be any connection. And if the study is repeated for several years they may compare the graphs from year to year, and so see the development and change that is *history* in their own community.

To become aware of all this sort of thing is greatly to strengthen the understanding of subjects and of the meaning of education. It is partly in this way that some of the developments referred to in the section on educational order can be realised.

The teacher should, at the end of a unit of study in one of these subjects, make his notes on the development of interest, knowledge, skill and attitude. This is done partly on the basis of his observations of the children at work and partly on whatever tests and evaluations the children may have worked out with him in the evaluation period at the end of the unit.

It is doubtful if there is much point in check lists in music or the arts. For the expert such lists could have meaning, but the average teacher may be wise to confine himself to occasional observations on individual children. What he will look for in these subjects is evidence that children are becoming more interested, that they become 'lost' in their work, that they are expressing themselves more fully and exactly, that they are developing better standards for themselves, and a keener appreciation of each other's work.

Examinations and reports

One of the purposes of evaluation is to inform the parents of their children's progress at school. Parents often want a particular form of report, especially if they have usually been given figures of 'place in class' or 'marks out of 100' that look as if they are very exact. But these figures are often far from exact and may be quite misleading. Teachers should think carefully what information parents should have and what it is possible and useful to give them at different stages in the children's school life.

In the early stages numbers and percentages should be avoided. The teacher should use letters or words to show the group the children are in for a particular subject, or write his opinion of how the child is progressing. This procedure, and any other changes in school reports, should be explained to parents before the reports are sent to them. If there is ever any chance that a child may be held back in a class—which should be a very unusual thing*—the parents should be told about it well before the time.

The important thing in reporting to parents is that the teachers should take the parents into their confidence and regard them as people to be consulted about their children's education—consulted and informed—before changes are made. This does not mean that the parents must have the final say in a matter of professional school policy, but the final decision should be made after the parents have had a chance to talk about whatever is proposed.

As children pass out of the junior part of the school, it should become more possible to give full reports on their achievements and their apparent abilities, using both examinations and teachers' estimates as a basis for the report.

Examinations should be set and weighted so as to reflect the importance of the various subjects and of the stated aims of teaching the subjects. Reports should inform the parents how the older children are doing, both in relation to other children and in relation to their own abilities.

---

* It should be unusual because long experience and many experiments have shown that children who are held back do not improve as much as those who are allowed to go forward. What children who are failing usually need is some extra encouragement and some special teaching. Holding back does not encourage and, by itself, it does not teach. There are exceptional cases where it is justifiable, but schools that hold back their children are usually failing to do the best for those children.

REPORT TO PARENTS HARRAR PRIMARY SCHOOL

NAME: John Nassa CLASS: Primary 5 *Date* 1967

	Possible Mark	Term 1st	Term 2nd	Term 3rd	Remarks and Personal Success
Swahili					
Speaking	400	200	250	300	*John has done as well as we expected.*
Silent reading	300	200	220	250	
Writing	300	220	220	240	
English					
Speaking	500	300	350	250	*Please see me about this. John has lost interest in English*
Silent Reading	300	200	230	200	
Writing	200	150	150	120	
Arithmetic					
Understanding	300	50	100	200	
Speed and accuracy	100	30	50	85	*Better than we expected.*
Problems	100	25	50	75	
Handwriting	A.B.C.	B.	B.	B.	
Natural Science	A.B.C.	C.	C.	B.	*Interested and beginning to understand.*
Health	A.B.C.	C.	C.	B.	*Interested and shows responsibility.*
History	A.B.C.	A.	C.	C.	*We are puzzled by John's loss of interest.*
Geography	A.B.C.	B.	C.	C.	
Art and Craft	A.B.C.	B.	B.	B.	
Music	A.B.C.	A.	A.	A.	*John has done as well as we expected in these subjects. Very pleasing work.*
Physical Education	A.B.C.	A.	B.	A.	

In general, John works hard and behaves well. We would like to meet his parents to discuss John's work in English.

Parent's Signature: Term 1
Term 2
Term 3

CLASS TEACHER: *A. Aba*
HEADMASTER: *Ali Hassan*

This Report Form is intended to show parents the relative importance of subjects. Some schools would think some subjects more important than shown here.

Let us briefly repeat the principles we have laid down:

1. The teacher must respect each child and treat him as an individual whose personal development and fulfilment is an end in itself.

2. The teacher must provide the activity and experience necessary for the children to understand what he wants them to learn.

3. The teacher must concentrate on the meanings and the values of what he is teaching. He must help the children to see the point of what they are doing.

4. Children must be helped and encouraged to explore, to think and to learn in their own way.

5. Children must be helped and encouraged to share their experiences, their thinking and their learning.

6. Teaching should proceed in an educationally logical order—the order that makes for understanding and that brings the knowledge and skill developed in one subject to bear on the problems of other subjects, and of life in general.

7. Teachers and children must take stock of their work to see where they are going and what they should do next.

S.C.E.R.T., West Bengal
Library
Calcutta
25/3, B. C. Road

CHAPTER FIVE

Planning the School Curriculum

In this book we make a distinction between the meaning of the word 'curriculum' and the meaning of the word 'syllabus'. We use the word 'syllabus' to mean the special statement of aims and programme of study set out for each subject. If a school teaches ten subjects it should have ten syllabuses. But we use the word 'curriculum' to mean the whole course of studies and all the other experiences that are planned for the education of children in a school. We do this because we think that some of the experiences that are not included in the syllabuses may be more important than some of the items that are included. In social studies (which may be equated with history plus geography plus literature plus all that is done to develop social understanding and social responsibility) we think that much of what is discussed in classes depends for its meaning on experience gained outside classes, or in classes not usually considered part of social studies, such as arithmetic.

A school curriculum plan should contain: (1) The general aims of education accepted in the school. (2) The programme of work, that is, the facts and skills to be taught, which are usually set out in the form of subject syllabuses, along with the main attitudes, values, habits, and characteristics that it is hoped to develop. The headmaster will probably include in this section the special aims or contributions to general education that he expects each subject to make and the general nature of the teaching methods that he believes are in line with the aims to be achieved. (3) A statement about the buildings and grounds, their care and development and the part he expects them to play in the education of the children. (4) A statement of policy for the organisation of the school, its discipline, and its social life. (5) A statement about the community and the part that it should play in the school life of the children.

Of these five sections of the curriculum plan we have already discussed (1) *The aims* (in chapter 1). We should consider what was said in that discussion in relation to what is now said about the curriculum. Here we merely remark that in our view the curriculum should help children to act responsibly as well as to think clearly. It should allow them to develop interests as well as to get control of facts and skills, and to be emotionally both well-balanced and sensitive.

In the rest of this chapter we put forward for consideration some ideas on each of the other four sections of the curriculum plan.

2. THE PROGRAMME OF SCHOOL WORK

Usually schools are supplied with official syllabuses but these should be regarded as no more than basic guides, mere skeletons of what is to be done. In any well-developed education system the authorities will insist that the syllabuses be regarded as general directions or suggestions to be altered according to circumstances. The inspectors will expect the syllabuses to be interpreted and adapted, and the teaching profession will insist on its duty to adapt, to interpret and even to change syllabuses.

In the early stages of an education system the teaching profession is usually directed rigidly by officials. One of the most important measures of maturity in an education system, and in the teaching profession of a country, is the ability to give and to take responsibility for the interpretation of official syllabuses. We are not making the suggestion that official syllabuses should be abandoned or neglected, for very few teachers are capable of producing as good a syllabus as the official one. We are making the assertion that no syllabus can exactly fit all schools, all localities, all children or all teachers, and that it is the duty, the professional duty, of all teachers to adapt the syllabuses to their circumstances. There are, moreover, always a few teachers whose vision of education in some ways is ahead of the vision built into the syllabuses. These pioneers of education need the support of the authorities to experiment and to work in new ways, for without them there is not likely to be much progress.

It is true that in many countries teachers do not feel free to interpret and adapt. It is true also that some authorities are much more rigid than others. But if teachers want to get and keep professional freedom they will have to get it in the same way as any other freedom is gained, by fighting for it in the first place, and exercising it moderately and responsibly in the second.

Assuming that we are in a fast-developing education system and are getting, or can expect, more and more freedom and responsibility to adapt the official syllabuses and use our own methods of planning our school work, how shall we go about it?

In this book we suggest that the first step is to look at the programme of work from several points of view and this may help us to see more clearly what we are really trying to do in schools and how we can best go about it.

A. Child development and the programme of work

We may begin by thinking of the development of children rather than the teaching of subjects (later we may bring these two ideas together and see the work as the development of children through the teaching of school subjects). We may think of the development of children as proceeding along a series of 'lines of development' such as:

1. *The development of the ability to think objectively*, which we may also think of as the development of the scientific attitude. Obviously the ability to think objectively should not be limited to science any more than the scientific attitude can be limited to this one ability. Obviously it is important to develop objective thinking in health, in history, in geography, and in the use of language.

By objective thinking we mean thinking that takes notice of the evidence and tries to play down our own private, or subjective, likes and dislikes. In arithmetic, for example, the objective fact is that 4 plus 5 is 9, and however much he may dislike the fact, anyone who gets 10 for the answer is wrong. Wherever children are asked to make a judgement or come to a conclusion, there is likely to be some place for objective thinking and some attempt to use standards that are not mere individual tastes or prejudices.

If children who are learning 'science' do not develop the ability to think objectively, so that even in science they will accept a statement that is not in accord with the evidence, they are not being properly educated. They are not, in fact, learning science or learning to be scientists. They are learning to remember material presented to them by an authority—and that is the exact opposite of science. The point here is that the teacher will only do a good job of education if he emphasises the development of the child more than the learning of what is in the textbook. The purpose of the subject syllabuses is to help the teacher, by providing useful material in a well-organised form, to develop the child's ability to think objectively.

To keep a balance in our own thinking we must remember that children cannot think about nothing at all. One function of the syllabus is to suggest topics to think about which are likely to lead to other topics requiring more advanced thinking. The weakness of most syllabuses is that they mention the topics but do not mention the thinking, so the so-called 'facts' are over-emphasised and the more important thinking is under-emphasised. The school curriculum plan should put this right.

2. *The ability to think quantitatively.* This line of development is very closely allied to the ability to think objectively. It begins with experiences in which the children become aware of differences in weight, length, colour, amount of time, strength, and so forth, and try to compare these differences. They learn to use words such as: more and less, hotter and cooler, darker and lighter, faster and slower, sweeter, heavier, etc.

Then they are asked to make more exact comparisons and this soon leads to the art of measurement and the use of numbers. In primary schools we think of this mainly as arithmetic, but the ability to think quantitatively is more than the ability to do arithmetic. Many children who do arithmetic quite accurately seldom use it to aid their thinking. Arithmetic is only a tool for the thinker. It is one way of thinking quantitatively. But the child has to see a purpose in thinking accurately, in making exact measurements, records, and comparisons to establish facts or to support his general thinking. He has to learn not only to do arithmetic but also to use it in more and more situations, to enable him to think more precisely and more objectively, and to communicate his thinking to others.

So the child who is really learning to think quantitatively will do so in his everyday life. For a school child everyday life consists of doing school work. He should therefore need to use the skills he learns in arithmetic to deal with the problems in other subjects, for example, *what number* of seeds are required to plant his farm plot? *What percentage* of business letters today use the old sloping pattern of envelope address? *What is the length* of the shadow from a one foot stick? At *what time* of day is it *longest*? At *what time* of year is it *shortest*? If your grandfather saw *the first* motor car to come to his town, *when* was that? How *long ago* was that? *How long* was that after the motor car was invented?

If two market women argue about the weight of a yam, *how shall we decide*? If there is a question about what an *average* worker can do in a day, *how shall we decide*? There is no end to the questions that can only be decided satisfactorily by measuring and calculating. But many people do not use arithmetic to think precisely. They guess. Often their guesses are wrong and often this is a nuisance. Most communities would be better off if they took more trouble to think objectively, and quantitatively, and precisely, about important problems. The reason why they do not, is not that they have not learned to do arithmetic, but that they have not learned to use it in thinking. People who respect arithmetic but have not learned to think with it are in great danger of being deceived by arithmetic. 'I am a great doctor. I cured a hundred per cent of all my small-pox patients in the last ten years.' This sounds good, but how many patients did he have? 'We reduced taxes by a million pounds.' Very good. But what does this mean to one man in a population of 20 million?

Children learn what they live. If their intellectual life demands accuracy, they will learn to be accurate. If it rewards precise quantitative thinking, they will learn to be precise. The teacher must therefore think of teaching the children to use arithmetic in many parts of their work, and to take the consequences of failure to do so.

For example, a class that is lucky enough to have some powder-paint may mix too much unless someone thinks ahead and decides how much paint is needed for immediate use. The surplus paint will then dry up, or go mouldy, and be wasted. The consequence is that the children are then losing the use of that paint and will have less painting than they could have had.

The teacher could easily do the thinking and mixing himself, but to do this is to lose an opportunity to educate the children. He should ask them to discuss the problem of how to make best use of the paint. He may suggest measuring it out if they do not do so. When they have agreed on a plan he should let them carry it out. If there is waste, he sees that they know it. If not, he should praise their good planning, and bring out the value of precise thinking, using measures and numbers.

Similarly the areas of school gardens may be planned. The consequences of poor planning may be too much garden for the school to cope with, or too little prepared land. If, for local studies in geography, the children are to make a school journey, they should learn to calculate their rate of walking and to measure distances on the map. Failure to be reasonably precise may result in very tired children. But a valuable lesson may be learned if the teacher requires the children to look critically at their planning.

Science, of course, provides dozens of examples where failure to measure, count, calculate, and record makes useful thinking impossible. Weather science is an obvious example. But to the alert teacher almost any school subject will provide opportunities to illustrate and emphasise the value of precise thinking, and the use of arithmetic for this purpose.

To some extent, of course, our point will be made by the accidents of life. But it will be better made if the teacher plans it and makes sure that the children see the point.

3. *The development of social understanding*. Most primary syllabuses include history, civics and geography and, under some other name, literature. These are the subjects through which children are supposed to learn about other peoples and cultures. Unfortunately, too many of the syllabuses and textbooks are written by people who are historians or geographers first and

educators of children second. The result is that the subjects become a mass of details—dates and places, names, products, happenings, maps and charts. It is said that the old 'capes and bays' geography has gone. Unfortunately it has been replaced by a 'products and places, a contours and directions' geography.

In general we have still not got to grips with the line of development which is the main reason for including these subjects in the curriculum. The purpose is to help children develop intelligent behaviour based on civilised attitudes in social matters. This can only be done by starting with the study of people and not with the study of places or dates. It is attitudes and values and principles of understanding that children need to develop. To do this they need to study actual and factual examples, and so begin to develop a picture of the world as it is, and as it is becoming, and of how it has changed.

The emphasis here is on the word 'begin' and on the meaning of 'world'. It is the world of people that we are mainly concerned with. The physical world of climate and soil and position is important only as the setting for the human world. If human beings did not have to deal with it, it would be of merely academic interest.

In dealing with this line of development, then, we will have to find ways of studying that will keep the geographer's hobby of map reading in its place, and that will not require the children to pretend to understand constitutional, industrial, or military history that is far beyond their experience or their intellectual capacity, especially in regard to motives.

What we have to try to develop first is the habit of imagining—that is, of filling words about people, past or distant, with a fullness of meaning, so that children begin to feel what it was to be alive in those days and in those conditions, and what it is to live now in places very different from their own. To do this we have to pay attention to a great deal more than the working day, or commercial affairs, or the names of cities. We have to be interested in other people as human beings who bring up children and worry about getting a living and keeping healthy. We have to be interested in their ideas of what the good life is. We have to believe that their religion means as much to them as ours to us. And we have to be interested in their ways of entertaining themselves, of making music and expressing themselves through the arts.

In the modern world, the need to understand other people and to get along with them is not limited to our immediate neighbours but extends to communities and nations in every continent. Modern transport, modern communication, international trade, international education, and the speed and persuasiveness of the modern press, radio and television mean that we are all influenced by happenings and by people in far away countries. We are all at the mercy of those who give us daily information, and we need far better equipment of intellect and character to enable us to deal humanely and sensibly with other peoples and with the information handed out to us. In this connection the special task of the schools is to begin to develop more effectively and deliberately than ever before those attitudes of open-mindedness, of willingness to be guided by the evidence, of unwillingness to form judgements in advance of the evidence, and of careful attention to the sort of evidence that is presented to us that will enable us to deal sensibly with 'information'.

One of the marks of social understanding is a willingness to accept the fact that we are all likely to be biased. So we must beware of our own prejudices and stereotypes about other peoples, and we must also make allowances for the probable bias of newspaper and radio. Children need to know what they mean by studying and understanding other people. They also need to know that to be either hostile or sentimental about other people is to make understanding impossible. On the other hand, to be interested, inquiring and sympathetic makes possible some degree of understanding.

The 'history' and 'geography' or 'social studies' of the primary school should help children to see that all human beings have the same immediate problems of life to cope with. They all have to find food and shelter, keep warm, protect themselves against dangers (whether of traffic or wild animals or weather) and look after their health. They all have to live in families and communities of some sort. As they come to recognise this important general fact, children should also come to see that the different ways in which these problems appear to people and have to be dealt with are largely due to different kinds of soil and climate and the location of their homes. But partly they are due to what has happened in the past—to the history over which they had no control. So most people, the children will come to realise, are basically much like other people, and they are all doing the best they can to live a good life under the circumstances in which they find themselves.

But immediately the question will come up—what do they think a good life is, and how do they go about getting it? It will always be found that they do their best to educate their children, to improve production or trade, to increase their control of the world (whether by scientific research or by magic or by prayers to their god). It will always be found that they make laws for themselves and form a government to look after the affairs of their country. It will be found that they have a regard for art, music, dancing, literature or whatever the arts of their country may be.

It will often be found that their ideas of a better life and their ways of trying to get it are a little different from ours, but on the whole, because they are human, they will want the same sorts of things as other people. Their motives, we will recognise, are much the same as our own are now, or have been in the not very distant past. To know what other peoples think is a good life, to know what some of their difficulties are, to learn why they live in their somewhat different way, is the beginning of understanding them, and is the beginning of intelligent and humane and responsible social behaviour. This does not mean we have to like or accept the vision other people have of the good life, nor do we have to approve of anything they do. But if we see in them some of the motives that operate in us, if we try to understand them, there is a much better chance that we shall be able to get along with them and that we shall improve our own ideas of the good life and of how to get it.

Because this chapter deals with views of the curriculum, we must now ask whether we can effectively develop our understanding of communities and nations, past or present, without quantitative and objective thinking or without using effectively the many modes of communication. If not, then the social studies may be one of the best places to learn to use the kinds of thinking and the special skills taught in other subjects. In the same way many of the skills and values of social studies must be practised in the learning of other subjects if they are to be well learned. For example, if we want children to be independent, but open-minded and co-operative thinkers, we must give the children opportunities to think for themselves, to discuss their theories, and to work together in *all* subjects.

The teacher who insists on all children setting out all work in his own way without considering the advantages of their various ways, and who uses the authority of force instead of the force of reason to get his way, is subverting the very qualities he pretends to be developing. 'If we waste time doing that, we shall never cover the syllabus' is a common statement, which is equal to saying, 'If I do things the right way I am wasting time.' Apart from being unprofessional in the extreme, this point of view demonstrates the necessity of re-considering the whole process of teaching the syllabuses. Either the syllabuses must be reduced or a more economic way of handling them must be found. In this chapter we are suggesting that there is a more economic way of handling much of the work of a primary school than attempting to cover each syllabus separately, and that this is more effective, regardless of whether the syllabuses are overloaded or not.

The right way, we suggest, is to emphasise major lines of development wherever appropriate, regardless of subject boundaries, so that the major ideas and skills of science are taught and used in, for example, social studies, e.g., the skills of collecting evidence, forming theories, and testing them. And likewise the major ideas, skills and attitudes of social studies are taught and used in other subjects. For instance, the idea of development, one of the main ideas to be taught in history, may appear in the teaching of health or science. The history of ideas need not all be taught in history time, nor need the development of our knowledge of health and science all be taught in health or science time. But the ideas and principles, the ways of thinking, the values we hope the children will come to appreciate, must, to become effective in the children's minds, be taught at many appropriate times. We must not allow the label of the subject to divert us from the task of developing the children's powers.

4. *The ability to use words to express and communicate thoughts and feelings.* We have formulated this 'line of development' in this way because we wish to emphasise the 'thinking' aspect of language development. There is no doubt that children need to develop their power over words. By 'power over words' we mean their ability to express their own thoughts and feelings satisfactorily for themselves and effectively for others, so that they will be able to interpret the speaking and writing of other people quickly and accurately. It is our opinion that this development is most rapid when children and teachers focus their attention on what is being said, read or written. The teacher's first question should always be concerned with the message that is being conveyed—the thought or the feeling. She should be asking herself: What is the thought? Is it clear? Is it interesting? Is it right? Is it complete? Is it original? Is it what was needed? Is it exaggerated? and so on.

Only after she has given proper attention to the thought should the teacher concern herself with the language and ask: Is it grammatical? Is it effective? Is it neatly expressed, or clearly spoken, or legibly written or correctly spelled?

If we want children to bring us their thoughts, we must put first things first in such matters, and attend to the thoughts before we bother about the words. To put the language first is to discourage children from serious thought.

The most important skills and habits we have to teach are skills and habits of thinking, but these require the support of skill in expression, in persuasion and so on. The implication of this is that most language development and most language teaching should be carried on in the teaching of other subjects such as history, geography, arithmetic, literature, and natural science.*

---

* We are here referring to the mother-tongue. The second language should, of course, have the same emphasis on actual communication, but we would doubt if it should be used to teach or learn subjects until it is well under control. See p. 130.

Children should have enough to read and to try to understand in these subjects not to need to waste time—and here we really mean 'waste time'—on such nonsense as comprehension exercises. Similarly these subjects, properly taught, provide so much speaking, listening and writing for real purposes that there should be no need and no time for oral or written composition as mere exercises. Children can be taught to be exact, brief, clear and interesting for real reasons connected with their work which enable them to see the point of these virtues in the use of language. The great problem with language exercises is that it is so difficult to give them any importance and that is why they are so ineffective.

5. *The development of aesthetic sensitivity* and of the power to express ourselves in ways that satisfy us, and that enable us to communicate more effectively with other people, has always been recognised as an important part of education.

However, with the organisation of the school programme into syllabuses and the domination of teaching by the timetable, the various arts of expression and communication have been isolated, as if they were separate from the rest of life. So the enjoyment of nature and of physical movement is hardly thought of as related to the arts. It is true that there is a proper place for art as an opportunity for the children to express their private feelings and as an opportunity for teachers to help children develop their control of various materials such as clay, paint, or crayon. Similarly there is a place for music which is no more than the repetition and enjoyment of traditional songs, and for traditional dances. But the aesthetic side of life cannot be confined to these.

The arts, including music and the dramatic arts, are modes of expression, which is to say they are as much tools of thinking as arithmetic or language. Therefore they are needed in the everyday life of children: in their thinking about social or literary topics; in the arrangement of their room and of the school grounds; and in natural science, in which the enjoyment of shape, texture, colour and movement is of great importance.

The child who does not admire and enjoy the shape and colour of a beetle or the smooth action of a fish, a cat or a bird, or the forms of the earth he lives on, or plants, has missed one of the most enduring pleasures of life and an interest that is at least as fundamental to the scientific attitude as the desire to classify. In actual fact children do enjoy aesthetic qualities in nature, and all that is needed is for the teacher to develop and refine their enjoyment, to make it more conscious, and to make children more respectful of what they find in their world. (See, the tokonoma, page 187.)

There is no one period on any timetable that is adequate for the development of sensitivity and good taste. This is a development that must be brought about through the whole curriculum. For there is no field where the principle that children learn what they live is more obviously true.

6. *The development of the ability to use one's physical powers effectively*. What we have been suggesting so far in this section is that a child's development, mental and emotional, is one stream of development. In this stream there are many lines or currents, which are flowing all at the same time and ought to be flowing all in the same general direction, so that they help each other forward. Teachers who understand this can teach much more effectively and economically than those who do not.

The teacher with vision who requires a child to express his observations in science logically, clearly, and exactly is not only teaching the facts of science. He is also teaching objective and quantitative thinking and the ability to communicate effectively, as well as developing the child's aesthetic responsiveness to objects, to ideas and to expression. The teacher will therefore be able to do each part of his work more thoroughly because each part will support the other. Teachers who do not see the network of connections and common threads between subjects must try to teach each item in a separate and unrelated way. For them there can never be a spare moment to stop and think and discuss the sort of point that arises by accident but which claims the attention of the pupils and should be grasped at once.

The need to perceive connections between subjects and lines of development is nowhere more important than in physical education. Concentration on muscular strength, games and athletic prowess has led to a cutting off of physical education from the rest of the curriculum. Yet the most direct and natural mode of expression is by physical movement. Mime, drama and dance depend for their effectiveness on the quality of the children's physical movements, and these in turn both depend on the imagination and stimulate the imagination. If we recognise these facts, we can see that physical education can and should be the basis of much of the most important development in expression and communication, in aesthetic sensitivity, and in the power to bring imaginative reality to social studies and literature.

In the few schools where this has been done, physical education has been recognised as possibly the most important subject in the curriculum, because of its profound influence on the quality of the work in all other subjects and on the social relationships of the school. See *The Story of a School*, A. R. Stone (H.M.S.O.).

7. *The development of responsible behaviour.* Here, too, it should be clear that development must go on all day, in all school work, and in the playground. The way children are taught every subject, the way they are consulted in making school rules, the way they share in running school affairs, will decide the degree to which they develop responsibility. They learn what they live. If they live socially active lives with exacting duties to perform, and some responsibility for making decisions as well as carrying them out, they will develop a high degree of responsible behaviour. If they are subjected to arbitrary decisions and bullying behaviour by teachers, they will resist and break out when they can. In some African countries such break-outs occur many times every year with older students who should be more responsible. If they are not responsible, the blame must lie with the parents and schools that refused them opportunities to practise responsibility and self-restraint.

The conclusion to be drawn from this developmental approach to the content of education is that to keep the subjects rigidly apart is to make teaching relatively uneconomical and ineffective.

B. Subject syllabuses and the programme of work

We now consider the value of the series of subject syllabuses which makes up the traditional curriculum. We may observe that its main use is to the teacher, who needs a constant reminder to pay attention to all the subject matter and all the modes of expression that children should deal with. The subject syllabuses become check lists, but all the topics in each of these useful check lists need not be taught in the periods of the timetable allotted to the subject. For example, many lessons on health may best be taught as part of a history lesson, a geography lesson, or even a literature lesson. Much of a child's appreciation of the value of arithmetic should come from work in natural science, in physical education, or in geography, and much of the most valuable work in drama will be rooted in that section of physical education called 'creative movement'.

Neither should the teacher simply teach each topic in the syllabus and then forget it. The understanding of maps, for example, or of the meaning of numbers, or of skill in the use of some sentence pattern in English, must be developed by frequent use in new situations.

It is necessary of course to remember that the traditional subject names are indeed traditional. The subject pattern for primary schools was established a century ago, and it is not too soon now to make some changes based on the experience of that century. Probably the primary school should have a subject called 'social studies' which is not formal geography or formal history but a study of people, their way of life, their pleasures, their aspirations, their problems, and how they have solved them. In the secondary school it will be soon enough to start 'history' and 'geography', and by the first year of University 'social studies' will have developed into a whole series of specialised subjects including economics, sociology, anthropology and psychology. Similarly the subject 'arithmetic' needs reconsideration. Arithmetic, algebra and geometry are specialised branches of the general subject called mathematics, which has several other specialised branches. In the primary school it might be better to use the broader term, mathematics, and come to the more specialised branches, including arithmetic, as the children move up the school.

In putting forward these suggestions about the organisation of the subject content of the curriculum, we do not intend to condemn or do away with the traditional subject matter but to ask how it can best be used in primary schools to educate children. We must ask ourselves whether, if language is a mode of expression, it is not better learned by simply trying to use it well to express thinking about work than by a series of isolated exercises. We must also ask whether, if arithmetic is really useful in everyday life, as we say it is, it should not be used more in the life of the school; and whether, if science is a way of thinking as well as a set of facts and theories, we should not apply that way of thinking in other subjects.

If you agree that this is so to a very large extent, if not entirely, you may accept the sentence: *A child learns what he lives*, as a principle, and ponder its meaning in different classroom situations.

For many years now the ideas 'correlation' and 'integration' have been used to suggest that many subjects should be taught in close conjunction. We are not suggesting that topics should be artificially pushed together by teachers to achieve 'correlation', but rather that a study of any topic should not be broken up or *dis*-integrated merely to fit a timetable.

Probably the most satisfactory practical arrangement for week to week work is to have a traditional timetable, which may be disregarded more and more as a particular unit of work develops in a class, such as a study of the local community in geography. During this study more and more of the language, art, physical education and history time would be given to work on the community study, but all these subjects would be used and practised in the study. When the study was completed the classwork would return to the normal order, until some other major unit of study began to absorb the timetable. In this way of working some time must always be kept for certain routine work such as health. The teacher must watch carefully to see that all areas of the curriculum get their proper share of attention.

3. THE GROUNDS, BUILDINGS AND EQUIPMENT

Because all the experiences that are planned for children at school are part of their learning experience, the grounds and buildings themselves, and the equipment, are a part of the curriculum. They should be planned to provide the experiences of order, beauty, sanitation and cleanliness from which the children will build some of their standards for the future.

The school grounds and buildings should be planned to invite children in, by providing for their interests and needs. For example, children love to be active—the grounds should provide open space to be active in. They love to try their skill at balancing on rails, at climbing, at playing with balls—there should be rails to walk along (a small tree trunk will do well), ropes or frames of wood to climb on, courts or goal posts and suitable balls.

Young children should have a sand pit. Older children may need a jumping place. But besides these, children need trees to shelter from the sun, and shrubs or plants that provide a variety of flowers and a place for gardening. If possible, there should be places where groups may work outdoors but in a sheltered and restricted space at drama, music, or dancing, or discussing school work, or at the kind of 'living method' geography or history we describe on page 118.

The buildings themselves should be well back from the noisy road. The rooms should be large—24 feet by 30 feet is a reasonable size for a class of thirty—and light. The roof and upper part of the room should be painted white to make the most of the available light. There should be enough shelves and cupboards to store the books and apparatus a modern school needs, a large blackboard, and furniture the right size for the children and the right kind for moving into semi-circles or small squares for group activity.

In every room the equipment will differ according to the age of the children, but all rooms must have some live plants that are kept just because they are beautiful, as well as seeds and plants being grown because they are instructive.

The rooms for the smallest children should open by several doors on to a play area that is an extension of the classroom, where the children can measure water, weigh rocks, and make things out of whatever materials they can collect.

Blocks, pegs, tins of seeds or shells for counters, soft clay for modelling and boards to keep the models on, some music-making apparatus, some pictures and some books should be found in every junior room.

Rooms for older children will need books, arithmetic apparatus, and materials for use in art and music.

A classroom should, of course, be kept clean and tidy—and scraps and rubbish must never be allowed to remain. But we must also remember that a classroom is a kind of workshop and a workshop is not made untidy just because it is full of children's work, much of it still in the making.

This kind of classroom—full of interesting things to look at, to think about, to work with—attracts children and they will begin to learn a good deal in it, even without the teacher's help.

What we are saying is that the grounds, the buildings and the equipment should present a whole series of invitations to children to test and develop their powers, to explore and discover, to construct, and to express themselves. The school setting, the setting for education, should itself present a large and appealing and varied and irresistible learning situation, so that any child would want to go to school to enjoy the place.

We know of course that many schools are not like that at all. But the young teacher who goes into a run-down and dilapidated old school should not despair. He should regard the place as a challenge to him and, indeed, he may never again have such a splendid opportunity to enlist the help of the children in making the school a better place to work in.

We have known young teachers go into a horrible old school and persuade their children to help improve it. Together they cleared the stones from the playing field and filled in the hollows, put up goal posts, burned the rubbish lying about, dug a drain, made a new latrine, and planted trees. Then, while the girls scrubbed down the dirty walls of the school, the teacher mended the broken old desks and the boys scraped them clean. Next the parents were asked to provide whitewash, which the teacher and the big boys brushed on to the walls and ceiling. The parents were interested by this time and they found money for cupboards, some books, and cement to mend the broken steps.

In just one term that teacher changed the whole appearance of the school and the attitude of the children and the parents to it.

There is one thing about a very bad school—it can always be improved, it can always be regarded as an opportunity. And when he has done his part, the teacher will usually find the parents of his pupils ready to help. What is needed is the imagination to see what can be done in a bad situation and the energy to do it.

4. THE MANAGEMENT OF CHILDREN

If we accept that the curriculum includes all that is planned for the benefit of the children, we must include the general management of the school, the policy on discipline and punishment, and all planned relationships between teachers and children as part of the curriculum.

The practice of regarding the lists of topics in the subject syllabuses as the whole curriculum of the school compels us to emphasise that some of the aims of the school cannot be effectively realised unless a wider view is taken. For example, we want children to be considerate, independent, co-operative, responsible, tolerant, open to ideas, prepared to change their minds in the light of experience, and so on.

None of these is a topic in a syllabus comparable with learning to read maps or to multiply, to write or to spell. It would be quite possible for a teacher to teach children to be inconsiderate, selfish, suspicious, intolerant of new ideas, and unwilling to change in the light of experience, but still to teach the subjects efficiently for examinations as held at present—and this, in fact, is happening in many schools. Students will all have met teachers of arithmetic who could not tolerate a method different from their own. And we all know that whatever is taught by authority and accepted without understanding becomes relatively inaccessible to reason. Some obvious examples are: religious ideas, race feelings, political prejudices. Examples closer to schools are: the rightness or wrongness of particular pronunciations, grammatical forms, letter shapes, spellings (program or programme?) and definitions.

INSTITUTE OF EDUCATION BANIPUR

Such attitudes, habits and values as are implied by the words: respect for others, independence, regard for the truth, moderation, co-operativeness, responsibility, kindness, consideration, tolerance of other people and other ideas, can only be developed in a very narrow and pedantic way, if they are to depend on lessons by the teacher. To make them real the school must itself be a working example of all its aims and values in action. In this way the children will not only hear about these virtues, but will come to know by experience what they mean.

The school must therefore practise what it preaches, both in its methods of class management and in the general organisation of the school. This means that in the making of decisions on policy, and in carrying out policy, the head teacher must share decision-making and responsibility with his staff, and the teachers must share decision-making and responsibility with the children—as far as is possible.

There are, of course, some decisions and some responsibilities which the headmaster cannot share, just as there are some that cannot be given to children. In general, however, few schools go nearly as far as they could in the direction of sharing authority and responsibility, or of deliberately setting out to show what their school aims and values mean in practice. Even when schools do this, there will be considerable differences in interpreting their aims and values and deciding how much can be shared with the children.

For example, when dealing with the maintenance and development of the school grounds, or with traffic dangers near the school boundaries, or with rules about rubbish disposal, or water supply, or the problem of getting clay for modelling, or bamboo and thatching for a shelter for the food-seller, and so on, some teachers would think it possible to explain the problem to the children, ask what they think should be done, and share the work with the children. Other teachers may explain what is to be done, but employ a man to do it. Others again will pay for the work and explain nothing. Obviously the first type of teacher will be giving his pupils experiences that will lead to development of social responsibility and better relationships in the school. The children will feel needed and will be able to contribute to their school community. They will develop self-respect and will also, we hope, learn a sensible attitude to practical work with their hands.

In the classroom the children should find a warm, friendly, encouraging and stimulating atmosphere, in which they will feel that their ideas are welcome and confident that their teacher is there to help them. They will find the teacher keenly interested in them and their work, and they will be able to share in the running of their class.

Many teachers cannot see how children can help to run a classroom. Here are some examples:

One teacher asked his class at the beginning of the year what they would like to learn. They gave him a list that included all he wanted to teach and a good deal more. He said they would not have time in school hours, so the children formed clubs to carry out some of their ideas after school.

Another teacher told the class he was worried about their English and asked: what should they do? The children made several suggestions, including writing up sentences about things around the room, always using English in physical education, and practising in school in groups. They began to use more and more English in everyday affairs and soon began to improve.

In one infant room when the inspector talked to the teacher at her table, a little boy gathered some children together and they began to sing. Another group went to a corner of the room and told stories to each other. They were learning to be independent.

In some countries the teacher divides his class into groups and sets work in their books or on cards. If a group finishes its work its group-leader will tell them what to go on with. They do not need to ask the teacher, who may be working with another group.

There are many ways in which children can take a responsible part in their class. One of the factors in making this sort of thing successful is the way the teacher goes about it. He must think carefully what he is going to do, and why, and how, so that everything is ready and the children are sure about the part they have to play. He must, too, be the leader of the class all the time—but, and this is very important, he must often lead from behind. There are times when a teacher must give orders in a direct way, but the most satisfactory work is done in rooms where the teacher does not give too many direct orders. Instead, he asks his children questions: 'Are you ready to do history now?' 'Can you be ready for arithmetic in five more minutes?' 'Would you like to go to physical education next?' 'Shall we make a play tomorrow?' 'Who will get the water supply today?'

This indirect method of working takes no more time than giving direct orders and it leads to much less tension between teacher and children, because the children feel they have a share in their destiny, for they are asked and not ordered.

In many classes there are, of course, children who talk too much or 'cause trouble' in some form or other. The teacher's first step in such cases is to stop and think: 'I am a professional manager of children. If this child is unable to behave pleasantly and work well like other children something must be wrong. Children naturally want to please their teacher. Only a child who is in difficulties of some sort will act like this. Probably some of the child's basic needs are not being satisfied.'

Then the teacher must study the child and try to find out what is wrong, and what needs remain unsatisfied. The teacher may never find out, but he must keep trying, just as a doctor must try to find out what is wrong with a sick man. He must not pretend to settle the problem by frightening or beating the child. These are not the kinds of treatment that a professional teacher will use. Beating and bullying belong to a past age. To use them is to admit to being uncivilised. In addition they are not effective. The teacher who uses the cane to keep control does not solve his problems. He goes on using the cane day after day for years, showing that the problem is not solved. Teachers who beat children for bad work simply make children hate school.

The classroom, we have said, should be a 'warm, friendly, encouraging' place. These words refer to the 'emotional—social climate' of the classroom. But we have also used the word 'stimulating' and this refers to the 'intellectual climate' of the classroom. A stimulating, intellectual climate is found where the children know the purpose of what they are doing and are eager to try to do it. In such a room new ideas and different ways of doing things are welcomed, and no one is afraid of criticisms because criticism is never of persons but only of ideas.

Many teachers will find it hard to permit criticisms of their own work. It is worthwhile for them to make a few deliberate mistakes for the children to discover. This will help the teacher to accept easily children's comments or disagreements at other times. It also helps many children to be more keen and confident. If we cannot allow children to differ and to argue, how can we develop intellectual independence?

One rule that every headmaster should lay down firmly, even though his staff may disagree, is, 'no corporal punishment is permitted without first consulting the Headmaster'. And the headmaster should be particularly firm about not allowing corporal punishment for mistakes in work.

There may be occasions, though not many, where corporal punishment is the right thing, but in general a school where corporal punishment occurs even once in a week is a bad school and the teacher who uses it does not know his job.

We have said corporal punishment, but in good schools punishment of any kind is rare. In a reasonably good school the children are doing their best, they are eager to learn and to please. They need success, and if they are not getting it there must be something wrong with the teaching, the school, or the home. One thing is quite certain—children do not have any basic need for punishment, and to have to resort to it is a symptom of failure.

No curriculum, however broadly we may look at it, and no matter what experiences we include in it, should include punishment. This is an experience we should plan to make unnecessary.

5. THE SCHOOL AND THE COMMUNITY

Schools, even if privately owned, exist to serve the children of the community. The curriculum plan of the school should therefore include a statement about relationships and communications between the school and the community.

The parents of children should be able to visit the school, meet the teachers, and discuss their own children easily and without embarrassment. The school should go to great trouble to explain what it intends to do and why. There will, of course, occasionally be parents who object to changes, but one of the tasks of the school is to educate such parents.

Schools should expect to be ahead of parents in educational policies, but they must have the confidence and support of parents, and therefore they should not only explain but, on some occasions, even delay changes until opposition has died down. This is not to say that parents' wishes should be allowed to override professional judgement, but only that teachers should be considerate, patient and diplomatic, and that they should plan each year to develop their relationship with the community.

There is not much doubt that the best way to do this is to get leading parents involved in helping the school and in planning some parts of its development.

CHAPTER SIX

Class Teaching

In this section we discuss the application of our principles to the programme of work in the classroom. We will begin with social studies, because this is the central subject of the curriculum.

SOCIAL STUDIES: HISTORY AND GEOGRAPHY

By social studies we mean studies of people: 'of what they are like—their beliefs, their aspirations, their pleasures, the problems they have to face; of how and where they live, the work they do, and the ways in which they organise themselves' (New Zealand Syllabus in Social Studies).

If we are to teach not 'social studies' but 'geography' and 'history', we need only to change our definition slightly. By 'geography' we mean, in the primary school, studies of how people live in the world today, 'of what they are like—their beliefs', etc. By 'history' we mean, in the primary school, studies of how people lived in the past, 'of what they were like—their beliefs', etc.

The aims of these studies are not simply to inform children, to stock their minds with facts, but (1) to help children to take an intelligent and sympathetic interest in the various peoples, communities and cultures of the world; (2) to help children to think clearly about social problems; (3) to help children to act responsibly and intelligently in social situations.

Our method will have two sides. First, as we have suggested in chapter 5, we must plan a school community in which the children are expected to think clearly about their own affairs and to take a certain amount of responsibility for running the school. We must teach all subjects in a way that will accustom children to thinking for themselves, to listening to the ideas of others, and to making decisions according to what seems to be the most sensible thing to do. In teaching any subject we must avoid giving 'Because I say so' as a reason: Children learn what they live. If we want them to learn to be reasonable, tolerant and independent we must see that they live and learn in a reasonable and tolerant community, where it is possible to be independent and different without being punished for it either directly or indirectly.

Second, we must also see that they know what being tolerant and independent and reasonable means, and why this is worthwhile. It is in the history or geography lessons that these meanings, and many others, are made clear. What is implicit in the general life of the school should become explicit during social studies lessons.

How shall we begin? With older children, in primary 5 or 6, we should begin by taking the children into our confidence, discussing with them what they are going to study, and how, and why. This is how one teacher did it: He began, 'This year we are going to study geography. In geography we study how people live in different parts of the world so that we can understand them better. What do you think we have to do to understand people? What does understanding people mean? I want you to go into groups and talk about that.'

After ten minutes the teacher called the groups together. Each group leader then told the class what his group thought understanding people meant. The teacher wrote their ideas on the board. They had ideas like: what clothes they wear, what language they speak, etc.

The teacher then said, 'Perhaps we should try to understand our own village first. What happens here?'

The children said, 'We go to school. We have markets. Our fathers work. We have church. The roads get mended. We have dances. We have sports. The chief holds meetings. Some women make clay pots. Some men go hunting.' And so on.

The teacher wrote all these on the board just as they came. Then he began to ask why their village did these things. The children could not always answer, so he told them to try to find out.

At the next lesson the discussion continued, and at the end of it the class agreed that in their village every family had to work hard just to stay alive and keep healthy. They agreed that every mother and father had to find a way of getting food for the family, and also clothes and a home to shelter in. The village people had to work together to look after health, to keep the place free from quarrels, and to keep the village clean and tidy.

Then the teacher asked why they had a school, why their parents wanted a church, why they had dances, why they wanted a newspaper, and what use the new bridge across the river would be. He asked why they liked to see traders come from other places, why they were collecting money for the new hospital, and why they voted for a member of parliament.

After much talking, the children agreed that everyone wanted to stay alive and that meant they had to get food, clothing and shelter, protect themselves against enemies—who might be people, animals, or diseases—and live in families or in villages to help each other.

They also agreed that everyone wanted to enjoy life and to live a better life if they could, and parents especially wanted children to live a better life. That was why in their village they held dances, had a school, voted, and welcomed traders who brought new things.

Then the teacher said, 'Now we know what we mean by understanding people. We mean knowing what people are like, what sort of work they do, what sort of food, clothes and houses they have, how they keep clean and healthy, how they enjoy themselves, what they believe makes a good person and a good life, how they get about from place to place, what they are proud of. And it also means understanding why—why they build houses their way and not our way, why they have their kind of food, and so on.'

The teacher then said, 'If we can find all that out about the people we study, we will be doing geography well. But there is something more—we also have to find out where other people live, and what their countryside looks like.'

Then the teacher said, 'Shall we begin by finding out more about our own village first? Then we will find out about people in other parts of our country. We will find out about people in the dry part, people who live by the sea, people who live in the forest, and people who live on the river. But where do we live?'

'We live on the mountains,' said the children.

'True. But which mountains? And where are they? How can we know *where* we live?'

'We know where we live. We live here.'

'True. But if you lived on the river, where would you say the mountains were?' From this question he led on to maps, the globe, and direction.

Perhaps we have said enough to show how this teacher tried to make his children think. At every step he asked them not only *what?* but *where? how much? why?* and especially *how shall we find out?*

What do we grow? Where do we grow it? Why there? (Because it needs rain.) How much rain does it get? How shall we find out? From these introductory questions he led to the study of rainfall and temperature.

This same teacher soon had his children finding that the answers to some questions lay in the past. They had to ask their fathers and their grandfathers what had happened. He soon showed them that they were learning the story of their village. And he told them that this kind of story, the story of how people lived and did things in other times, and of how things changed, was called history.

In making his start in this way you will see that this teacher was beginning with our first three principles. He showed respect for his children by discussing seriously what they were going to learn, by getting clear the purpose and value of the work, and by using their own experience of life in their own village. He helped them to see more meaning in their own experience and he helped them to get more exact experience. For example, he taught them to use graphs to record rainfall, and to use averages to compare the climate and the productivity of their village with other places.

He taught them to make maps to record what they found out about their village. Because it was a mountain village and some plants grew high up and others low down, he was even able to teach the idea of contours from their own observations.

You can easily see that in this class there was plenty of group work and plenty of individual learning, too (Principles 4 and 5). It is also clear that the work followed on in a natural way (Principle 6).

You may not see quite so easily that evaluation (Principle 7) was being carried on continuously by the procedure of asking questions. These continually required the children to extend their purpose of understanding, and also continually showed them that they were moving on from one point of understanding to another. The basis of evaluation, however, was laid when the class agreed on what they had to know in order to understand some other people. At the end of the study the teacher simply said, 'Now let us look back and see what we have learned. We said that we need to know these things (what food?, why that kind of food?, etc.). Have we found out?' The children thought about that and agreed they had found out a good deal, but not everything. The teacher was pleased at that, for he could see they were learning that it is not so easy to find out everything and that they knew their understanding was very far from complete.

The question of how they made the study of their own village is easily answered. They put down on paper all the main questions, such as:

What food do we eat?
What do we live in?
How do we educate ourselves?
How do we travel about and carry goods?

Then a group of children took each main question and made a set of smaller questions. For example:

What do we live in? We live in houses.
How big? What are they made of? Who builds them?
How long do they last? What sort of lights?
What sort of cooking place? What sort of water supply?
What sort of food store? What sort of door, window, floor?
How much does a house cost?
How many people sleep in a house?
How near are the houses to each other? Do they have a wall or a garden around them?

Next the children looked at the houses to answer the questions. Sometimes they found two or three answers to a question. They drew plans of some houses and pictures of others. They found that some new houses had new building materials. They tried to find the oldest house in the village to see how different it was from the newest house. They tried to find why changes were made. They found all the new houses were in one part of the village and they made a map to show where the old and new houses were. This map showed that the best new houses all had a good supply of water from wells.

To finish their job this group had to tell the other children what they had discovered. They wrote their report on sheets of paper and these, with their maps and pictures, they sewed into a brown paper cover. On the cover they wrote the words: *Our Village Houses*.

Every group did something like this. They had books called *Our Food*, *Our Farms*, *Our Fun* (about sports, games, dances and music), *Our Market*, *Our Transport*. Every child wrote a little story called 'My Grandfather and Me', telling what his grandfather did in life and what he wanted to do himself.

The class even made up a book of little poems and pictures about their village and they put in the words of some village songs.

You can see that the study of the village was a very full one. It brought in art, arithmetic, poetry, plenty of speaking, listening, writing and reading. Although it began as geography it included history. The children had to think how to make books, how to make maps, how to set out their pages neatly, what was important and what was not. In this study they really learned a lot about their village. They explored it and discovered what it meant—meaning emerged from experience.

Nobody told these children they ought to love their village and be loyal to it. They just had to find out about it. But by the time they had finished they were, it was clear, very proud of the place they lived in—and this, we believe, is the beginning of the sort of loyalty that one can respect.

The next question for the practical teacher is: how do children go on from there to the study of other people in other places?

First the teacher tells them which people they are going to study. Then he asks them what they must do to study those people. A little discussion makes it clear that to study any people means to find answers to the same questions. The great problem is, how to get the answers. Discuss this with the children, too, and it will soon appear that there are several ways to get the answers. The best way, no doubt, is to go to the place, to see it, and to ask questions. This is usually quite impossible, but not always. If our village is on the mountain side near Bauchi in Nigeria and we intend to study a different people, the cow-Fulani, we may find some of them driving their cattle nearby. We may visit their house, talk with them and learn much about them at first hand.

Usually, however, we cannot see another people living their different way of life right beside us. Instead we must read books, look at pictures, listen to the radio, and ask any one of our town people who has actually been to visit those people. We may, sometimes, write a letter to school children in that place to ask some questions. Finally, we may ask our teacher to tell us. Books, and pictures, letters and people are our sources of information when we cannot see for ourselves.

The teacher should help the children to use these different sources to support each other and also he should teach them to think carefully what it may be like to live in that land.

The school we have just talked about was not at Bauchi but in the Cameroon mountains. Although the children had to study the people of Northern Nigeria they could not go there and no cow-Fulani came to their village. They began by looking at pictures in a magazine. One picture showed a city, Kaduna, another showed a house of sticks and leaves. They talked for a long time about those pictures and in the end they saw that there were many answers to a simple question like: 'What materials do people use to build houses in Northern Nigeria? There were several answers, too, to why people build different kinds of houses. They soon saw why the Fulani built their stick house and they even built a cow-Fulani house in their own playground. When enquiring about the kinds of houses and why there were so many cattle, and why the northern people grew groundnuts instead of cocoyams, they found they needed to know what sort of weather came to Northern Nigeria. The teacher showed them how to look for information about this in their atlases.

These children first began to use maps to record their own study of their own village. Then they began to get from other maps the information recorded there about other places.

One day a Hausa trader came to their village. The teacher asked him to come to the school. The children asked the Hausa trader many questions about his home in Zaria in Northern Nigeria. They learned some Hausa words from him, too. Afterwards the big girls brought coffee for their guest and the biggest boy made a little speech to thank him for coming to their school.

Outside in the playground the teacher had a geography garden. Most of it was just a flat square piece of concrete. The children made a clay model on this flat concrete. They had their own Cameroon mountains at the south side and they put little clay houses at the north side to represent Zaria and Kaduna. They drew the River Niger with wet clay on the concrete, and then they found where other towns of Nigeria must be. They put in Onitsha and Enugu, Makurdi, and Jos, and the main roads to get from their village to the north. Every day some children added new towns to their model of Nigeria. Sometimes they argued whether towns were in the right place and had to look carefully at the map to see. Thus they learned to use maps.

They also wrote stories beginning 'My name is Ali. All day I watch my cows.' They were imagining they were cow-Fulani.

Now let us see how our teacher dealt with history. He used the same sort of methods. First he told the children what they were going to study. Then he asked them what they ought to know at the end of the study. They made a list of questions about the explorers:

> Why did they come? What sort of people were they?
> What did they think of the people and places they saw?
> What did people think about them? How did they travel?
> What were their difficulties?

Many more questions were noted down as they talked.

Then the teacher told the story of an explorer. When he had told the story the children decided to act it. Some acted the explorer strong and proud at the beginning of his journey, tired and sick later. Some acted the Chiefs he met on the way. Some were porters, or hunters, or canoe men. By acting the story they came to know it well. Then they made music to go with their acting. One day their parents came to school to see the great play: The Explorers. When doing all this, the children also learned of many changes in their country, especially in roads, cars, religion and health. They had some special lessons on these subjects and they made a time chart to show the changes.

At the end of each unit of work in history or in geography, the class had an evaluation period. They looked back at the questions they had started with. The teacher asked, 'Did we find the answers?' They discussed their successes and failures and whether it was worthwhile. They noticed they had learned many other things, too. Perhaps the most important thing was that they learned how to study, how to think, how to ask questions, and of course they did a lot of very useful reading, and writing, drama and art, and music.

What of the Younger Children?

In the best schools children begin to learn about their own village from the very first year. The teacher takes them to visit the blacksmith who makes iron blades for farmers to hoe the soil. They watch the bellows and the charcoal fire. They wonder what would happen if there were no blacksmith. Back at school they play at being blacksmiths and even try to make charcoal. They talk about everything the blacksmith did. They draw the blacksmith and write sentences. They make a Blacksmith Book. They make a list of words for tools. They even make a Blacksmith Poem.

On the floor, with chalk, they draw a big picture of the road to the blacksmith's shop. This is their first map. It has no scale, but it is a beginning.

Next week they visit a farm, then the market, then the pottery.

When the weather is too wet for visits, the teacher tells the children about children and their families in other countries or in other times. Then the children draw pictures of those other children and make models of their homes. The models are not very good, but they help the children to imagine what it is like to live in other places.

When children act the life of other people very well, they imagine that their classroom is a village or a home in another country, and for a week or two they act as if they were living far away. For example, the children in one school far from a river imagined they were living in the Niger delta in flood time. When they left school they each pretended to get into a canoe and paddle away across the flooded river to their homes.

This imaginative method of study is sometimes called the 'living' method. For young children it is probably the best method there is. It requires a patient and imaginative and resourceful teacher, but it can have a very remarkable effect on the work in other subjects—especially language.

LANGUAGE

There are two departments of language learning for most African schools: the learning of the home language or mother-tongue and the learning of a second language.

The home language

Most children are already well advanced in their own language when they come to school. They use all the basic patterns and all the most common words, although they may be unsure of changes of form for some words and they may not be acquainted with every idiom. Many secondary meanings will escape them, and they will still have much to learn about combining or varying basic sentence patterns.

But children would learn to speak their own language quite adequately if they never came to school at all, simply by hearing it and using it in everyday life—as their ancestors did for thousands of years before schools were thought of. Why, then, do we now find it necessary to teach children their mother-tongue? And why are we concerned that many of them seem to learn it badly?

There are undoubtedly many reasons for this, including the impact of other cultures and other tongues, but before we teachers look outside the school for excuses we had better look at our own practices. The fact is that many children suffer a set-back in language development when they come to school—the very place that was intended to help them. The main reason for this is that they are stopped from talking about the things that concern them. Children, we say again, learn what they live. If they live silently, they do not learn to be clear and fluent speakers.

The first and most effective thing for schools to do to improve the speaking of the mother-tongue is to encourage children to speak it in school. The teacher's job is to help children to speak their language better, first by helping them to enjoy conversation with each other and discussion about their work; second, by setting a good example, so that the children have a useful source of new words to use; third, by providing plenty of interesting stories, activities, pictures and objects to talk about; fourth, by concentrating on helping the children to think clearly and to express themselves effectively, and not concerning themselves too much at this stage with correcting children's language except by example.

In terms of our principles we must:

1. Respect the child's need to think and to talk with other children and with teachers.
2. Give him plenty of experience of language, i.e. *hearing* the teacher, and *talking* with other children.
3. Provide purposes, e.g. to explain, to entertain, to get the message right, to communicate thoughts effectively, to be heard clearly.
4. Permit children, indeed, *encourage* children, to express themselves in their own individual and often original ways, and to enjoy each other's individual ways of expression.
5. Provide the stimulation, and the opportunity for learning, that comes from sharing work (conversation and discussion) in groups of different sizes.
6. Allow development to occur in an educationally logical way, that is through natural challenge and the needs of real situations and *not* as set out week by week in an official syllabus or

textbook. The children's language will develop according to the emotional climate of the room and the needs of the situation. No book of exercises ever devised has been as effective as a genuinely lively group of people hard at work on other things, for improving a child's ability to use effectively his mother-tongue.

7. The teacher's evaluation should be mainly by admiration and encouragement in the lower classes, e.g. 'That is good.' 'That is better.' 'You are doing well.' 'Listen how well Joseph says it', etc. In the upper classes the standard set by the teacher, and which he must teach the children to use, is always the same: Did you speak effectively? Did you express and communicate your meaning? Was your language appropriate to the occasion? And—did you hear exactly and interpret correctly what was said?

Writing and Reading. So far we have considered speaking and listening, and we must emphasise that in both mother-tongue and second language these two major skills are very, very, much more important in the early stages and in later life than the other two major skills, which are writing and reading. (We do not, here, refer to handwriting, but to the ability to express oneself in writing. Handwriting is to writing what the ability to articulate words is to speaking.)

Nevertheless, the ability to write and to read are more important than any other subject skills children learn at school. They are so important that teachers should be prepared to re-organise their whole teaching procedure in order to improve them.

We say this in the certain knowledge that African children from primary school to University are handicapped by the inability to grasp the meaning of what they read, by inability to read for different purposes (e.g. to get the main idea of a passage, or to get specific information from a passage) and by extreme slowness in reading. They seldom reach half the speed of children in most English-speaking countries and the consequence is that they spend a great amount of time studying and get a very poor return for it. African children are just as intelligent as any other children. The reasons for their poor performance in reading are to be found in:

(a) the methods of teaching reading
(b) the large classes
(c) poor supplies of paper, crayon, and soft pencils
(d) too few books
(e) reliance on a single series of readers
(f) a home background that does not support the idea of reading by supplying books
(g) the low status of infant teaching—the very place that requires the greatest skill in teaching and ought to have the highest status.

What we have said above applies to reading both in the mother-tongue and in the second language, but it is in the teaching of reading in the mother-tongue that the need for improvement is most urgent. This is because the reading of each word separately, and the saying of each word as it is read, become habitual in the first two years and are carried over to the second language. These bad habits are then made stronger by teachers for whom nearly all reading lessons are oral reading lessons.

It is true that in the early stages of reading the children learn the meaning of written words and sentences by hearing them spoken with a natural expression. But as soon as they begin to realise that what they are reading is 'talk' or 'thoughts' written down, they should learn to get the meaning silently. There is no more need for the children to say each word they read than there is to say each word they hear when someone speaks to them.

Children must get away from oral reading as soon, and as much, as possible, even in the first year. Until this is done, Africans will be slow readers. Any child who leaves school reading familiar material at less than 200 words a minute is too slow. At grammar school a child needs to read at 300 to 400 words a minute to be an efficient student. Most African students who have been tested, even at the University level, read at less than 200 words a minute, and this must be a major reason for failure in examinations at all levels.

To read faster, children must not read each word, saying it silently in their heads. They must learn to read ideas which are usually written in groups of words. They must grasp the idea of a group of words at a glance and pass on without saying even one of the words. Only when he comes to a difficulty does a fast reader stop to examine and pronounce a word, or go back over a sentence.

It is possible to begin teaching reading from several different starting points emphasising different principles of teaching. Most teachers start with pictures, and captions consisting of one or two words. They show the children the pictures, talk about them, and then tell the children what the words 'say'.

A better way might be to ask the children to draw their own pictures. Then the teacher asks the children what it is about, and then 'What would you like underneath it?' The teacher then writes the words, and the child is asked to try to copy them. When the child can copy the words, he has begun to write, to spell, and to read.

Each child in the beginner's class draws and writes every day. Each child reads what he writes to other children about him. He thus reads his words many times, and he sees many words read by other children. In this way we begin with the children's own interests, we help each one to learn individually and at his own rate, we provide a lot of varied experience, we provide shared experience, and, of course, evaluation proceeds continuously, always emphasising the success of the children.

In this way we begin with each child's own thinking and each child's own expression. The words are never 'sounds' to be interpreted. They are already 'thoughts' that have been written. The emphasis is on the thoughts, not on the letters. Very soon the teacher can give some lessons to help the children to write letters more easily, but not before the point or value of letters—to write thoughts—is clear to the children.

Very soon, too, the teacher will begin to write on the blackboard words that will have meaning for the children. As soon as the children can read their own names they can learn to read and obey: 'Come here, MARY' and 'Today JOHN will play the drum'. 'Today is MONDAY'. For these sentences that are used every day the teacher puts up a card for the new word. The children soon learn to act according to the sentence. On the first day of school the teacher begins taking the children for walks. They usually go to see something special. When they come back the teacher asks them to tell what they saw. What was the most interesting thing? Then she draws whatever it is —very simply, of course. And she writes under it the children's words: 'We went to see a flame tree.' 'We saw a snake.' 'Joseph fell over.'

At first one sentence will do. The children can all read that sentence at once, because they made it. Let them read it all together. Let some read it one at a time. Ask which word says 'flame', or 'snake'.

This sort of lesson—experience and observation leading to talking and then to writing by the teacher on a sheet of cheap paper, and then to reading by the children—provides reading with meaning from the start. It can be extended to several sentences quite quickly.

The sheets of paper should be fastened together and hung on the wall so that the children can read them again. When the children begin to write more, they can go to the charts to find how to write words they need.

This sort of work is not to be stopped as soon as the children begin their reading books. It should be kept going and developed in different ways, so that the children always have some writing and reading of their own.

When the teacher decides to start using books, she should begin by talking about the pictures with the children, getting the children to think about the pictures and to think what the words on the page might be. There should be lots of praise for those who guess right, and if the talk about the picture is properly directed, not many children will guess wrong.

It is, of course, important that at first the children should know every word and be able to use it before they see it in written form. Later, when the children are confident that they can read, they will enjoy finding new words. They will specially enjoy funny words.

Children in most countries have their own rhymes, and the school should collect some of these. Children, too, often say things that are as much child poetry as their drawings and paintings are child art. Teachers should collect these and help the children to write them down to be enjoyed. Here is an example that a teacher copied down from a little girl's singing:

DEBBIE'S SONG

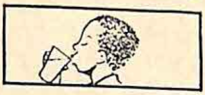
As I was walking down the street
The rain dropped on my head
And it dropped on the ground

A girl was walking behind me
And the rain sang on her ears
And it sang on her head
And it dropped on her glasses.
(5 years 3 months)

A class where the teacher listens for such things begins to enjoy using language, begins to know when language is being well used, and often has something new to read.

When new books are hard to get, the teacher and children should write them so that there will be something to read. The teacher needs brown paper or newsprint, and some sort of felt pen or ink marker. Then she can write books with quick pictures. One kind, for six-year-old children, is the question and answer type:

1.
What has a leopard?
A leopard has claws.

2. 
What drinks water?
A boy drinks water.

Another kind is the class story:

> 'One day Mrs. (teacher's name) went for a walk. Mrs. .... met Samuel (a boy from the class) and he was dressed in his old clothes. Samuel said, "I am going fishing".'

Any teacher can carry on a story like this, and she can even say, as she writes Samuel, 'Where were you going, Samuel?' and Samuel will add to the story. When the teacher writes books like this she provides something easy to read, with a local background. At the same time she helps the children to see how they can write their own stories. They need plenty of practice in writing and reading. Each improves the other.

As the children grow older, more and more reading should be silent and the teacher can test the children's reading ability in two ways. First she asks them to read to find out something. Second she asks them to read, and then asks them questions about what they have read. Usually, however, this sort of questioning about reading should be a part of the work in history or geography or literature. That is, the children should read for urgent purposes—for their own enjoyment, or for information they need—and not for the less urgent purpose of doing an exercise in reading.

Our final remark on reading is this: As soon as the children become confident in reading, the teacher should put some pressure on them to read silently and fast.

Perhaps once a week the children might be timed to see how fast they can read. Time exercises should always include answering some questions to make sure the children do actually read.

Although all the examples here given are in English, there is nothing in these ideas that is specially for English. They are true for any language that is the children's own home language. The development of power over language begins with freedom and enjoyment of expression, and continues with purposeful communication that contains its own discipline.

Learning a Second Language

The problem of teaching a second language is a complicated one in some ways.

First there is the fact that teachers and textbook writers in the past have taken a very pedantic view of language and have acted as though the 'real' language of a people was the written language of good authors. Today the general view is that when we learn a language like English or French what we need to learn first is the language the ordinary man speaks. This, of course, is what children learn when they learn their own mother-tongue, and it should be no different in the case of any other language.*

Similarly, in the past teachers thought that children should learn a language by learning its grammar and its vocabulary separately and by translating ideas from one language to another. Today the best teachers believe children should learn the second language by much the same processes as they learned the first.

But although the processes may be similar, the circumstances are very different, and therefore the processes must be adapted. It is a case of finding out what the general principles of learning are and then seeing what they mean in the new circumstances. For example, some points of learning may require very intensive practice, because habits from the home language interfere with the forming of some of the habits required for the second language.

This new approach to the teaching of a second language is based on the study of linguistics, and on many pioneering studies of teaching. These studies are far from complete, but a great deal has been done and the results are published in a number of books for teachers, such as those by A. S. Hornby, F. G. French, Michael West and P. Gurrey.

All students of teaching should read some of these carefully and consider what they should mean in practice in the classroom. There is no doubt that the new approach to learning a second language is very much in line with our principles. The authors of all the books put emphasis on learning by experience and activity. The children are to learn the sounds and rhythms of the new language by careful listening and imitating, at the same time as they learn the meaning and use of words and sentences by seeing and performing the actions, or seeing and using the objects that the words refer to.

Learning is to begin with the total experience of listening, speaking and acting for each individual, each child sharing the experience that brings words and meanings together. Learning is to continue with children practising the language together

---

*But if we cannot hear enough good speakers of the language to get 'the feeling for what is right' from them we will be well-advised to get it by reading as much as possible—for enjoyment.

in groups, small and large, and using it in their daily life, so that *the main purpose and value* of language—to communicate—is emphasised from the start.

In this case the children enjoy communicating in this special new way just for the pleasure of it. It satisfies their need to use their powers, to get success, and to be members of a group—the group who can speak this new language. If they do not thoroughly enjoy their language learning, the teaching is bad and the teacher must change his way of teaching at once. But the children, in most cases, will also know quite well that this new language will open to them the opportunity to speak to many more people and that it will make continued education possible. So for them it should have a future value as well as being something they enjoy in the present.

The linguistic approach is also completely in line with the principle of educationally logical order, as can be clearly seen in two ways. First, by the general order of teaching: *listening and speaking* with full understanding is to come *first*. Reading and writing are not to be undertaken until *after* the spoken language and the ideas to be expressed are thoroughly familiar. Second, by the detailed order of teaching the elements of the language, which emphasises the most useful words and most simple and usable sentence patterns first. In this connection it must be noted that the textbook cannot do everything, and one thing it cannot do is to provide the words that are of special interest for every locality. The teacher will have to provide some of the words, which we may call *experience* words or *interest* words to enable their children to mention special interests.

The interest of the children is the growing point of learning. If a child wants to learn and use the name of his pet animal, or of a railway train, or of a canoe, we teach that word. We always give children the words they want. The carefully thought out textbook will, of course, be our main guide, as it will satisfy most needs and we cannot do without it. But we must not allow the textbook course to become an intellectual prison to stifle interest.

Teachers must remember, too, that although a second language is important and requires much practice, it must not be allowed to damage the general intellectual development of children. This it will do if it stops them from thinking and trying to understand what they are taught, which they can only do in a familiar language.

Unfortunately, however, in many places the schools are so eager to get proficiency in the second language that they neglect the mother-tongue after the first one or two years. Very soon all teaching is done in the second language and it is hoped that this will provide the needed practice in the second language. We argue that this procedure is quite wrong, for four reasons:

1. If we insist on teaching and learning in the second language—let us say it is English—most children will be prevented for some years from thinking and expressing themselves clearly or freely because their vocabulary is too limited. Very often they may have no word for what they want to say. Most of the time they will be unable either to recognise or express the finer shades of meaning. This is a terrible handicap for a young mind during a large part of its most formative stage of growth—the very stage when appreciation of reason, principle, and the abstract in thought is becoming important to the child.
2. As soon as English becomes the language of instruction, there is a continual uncertainty about the teacher's meaning. Instead of his language being a lens which enables him to focus children's attention sharply on their subject matter, it becomes a fog through which they see what they have to learn only dimly.
3. In despair the teacher drops back into the mother-tongue to explain. He thus begins the habit of two-step expression: think in the mother-tongue, translate into English. The effect of this is disastrous as, apart from making all thinking much slower, it causes the children to use their native speech patterns in English. The aim is to think in English. Translation ruins this aim.
4. The result of all this is that for years the children do not expect to understand what the teacher says. They try only to remember it. They try, always, to write notes that they can learn by heart. Unfortunately this writing of notes does not help much

> with reading because the teacher, knowing the children are poor readers, explains everything to them. Then they copy his notes on their textbook material and learn the notes. They then make little effort to read intelligently themselves.

The resulting attitude is that school work is to be memorised and reproduced, not understood and used. This is exactly the opposite of what every modern educator believes should happen.

In time, of course, some of the children do become familiar enough with the second language to understand what they hear and to be able to get meaning from textbooks themselves. But the old habit persists. The students do not wish to think about their school work. They want to take notes, to memorise, and to reproduce.

The purpose of all this bad teaching, we must remember, is a reasonable one—it is to ensure that the children will get enough practice to be thoroughly familiar with English. The teaching of subjects through a second language at an early stage is really an effort to use the principle: *Children learn what they live.* But unfortunately in this case they do not and cannot live the right thing. They cannot live an active, purposeful, independent intellectual life, if they have to do so in a language they do not understand.

The principle does not fail. It works. The children do learn what they live. They live a confused, anxious, intellectual life in which they survive mainly by clutching at straws—at notes which they can memorise—and by carefully *not* thinking for themselves and *not* relying on their own judgement about the meaning of their books.

In short, they learn the very opposite of those intellectual habits and attitudes that their teachers should be trying to develop. If this judgement is correct, what should we do?

It is quite clear that most African children should learn a second language, and for most readers of this book it will be English. They need this language:

1. to allow them to share in the intellectual and commercial life of the world through the use of books, newspapers and the radio.

2. to communicate with the majority of their fellow Africans who have different mother-tongues.
3. to continue their studies.

The sooner our children learn English, the better, but three points should be remembered:

1. They should learn the language well enough to satisfy the three reasons above.
2. They should not learn it at the expense of the rest of their present intellectual life, and
3. They should not handicap their future by learning bad intellectual habits which make it difficult for them to study or to think independently.

Here is a plan to improve matters:

A. Increase the time given to speaking English in primary 1 and 2. Some of the daily rituals, e.g. greetings, observing the weather, singing a birthday song, could be used as daily practice, with standard, but slightly varied questions, answers, and statements. As soon as one of these has been extended so that the children know well and use correctly all the appropriate sentences and words, another centre of interest can be used. When weather language is complete, we may begin with food language, and then go on to attendance language, playground language, classroom tidying language, weather language, games language and so on.

If this sort of practice comes into the English course used in the school, that is good. If not, the course may suggest similar activities. But the course should always be taken as the minimum to be done. Use the sentence patterns and words provided in the course.

Provide other experience words and use again the sentence patterns and 'structural' words from the course to bring English into the daily life of the class at frequent and regular points every day.

Teach everything else in the mother-tongue, but if a *child* uses English, enjoy it and encourage it.

B. Increase the time given to the teaching of English in primary 3 and 4.

First, give more time to the actual English course lessons.

Second, tell interesting and easy stories in English.

Third, take in English any *revision of work that is already well known*, so that there is no question of having to write notes or memorise facts for examination, although the treatment might lead to better understanding of the subject matter.

Fourth, teach English in everyday life, as with the birthday and weather items for primary 1 and 2. Physical education is a good place for this. All orders can be given in English. Let the children repeat the order as they do the action. Introduce sentences: 'We are going to run. Start. We are running. We ran around the compound.'

When the children change clothes, wash, or go into school, they can say what they are going to do, what they are doing, and what they have done.

Next they work in pairs to ask and answer questions, e.g. 'What are you going to do?' 'I am going to change my clothes.'

The same sort of work in English can accompany garden and farm work, compound cleaning, art work, and all other active work where there is little or no teaching of new facts or ideas—especially facts needed for examination.

During the day when the children are not trying to understand subject matter, but to greet each other, to talk or sing, or to carry out the community work of the school, they should be encouraged to use English.

All school orders, all references to time, holidays, playground activities, cleaning the classroom, praising or criticising work, enquiries after the health of parents or the state of the weather, etc., may be in English. The teacher should, of course, give special lessons to enable children to deal with these situations.

When lessons have been given on, let us say, English required for the cleaning of the grounds, and the grounds have been cleaned a few times, using the needed language, it will be time for the teacher to give a lesson in writing and reading those words. He can do this by getting the children to tell him what they did and what was said. Then, when the sound and meaning of the words is perfectly familiar, he makes a paper chart like this:

PLAYGROUND WORDS

Path. Goal posts. Garden.
Tap. Latrine. Stones. Tree.
Weed. Flower.
Collect the papers.
Tidy the corner.
Empty the bin.
Wash the steps.
Come into school.
May we go home?
You may go home.
Please help me dig this hole.

The children may then write down what they did and said. They use the chart to find words they need. They should thoroughly know enough sentence patterns to be able to write such a simple account before they are asked to do so.

The sentence patterns must, of course, be taught in the English lesson and used many times before the children are expected to write them or read them.

A subject such as work in the playground could be used several times a year to teach sentence patterns, or to teach new words, or to give practice in writing and reading. The essential point is that the children should be thoroughly familiar with the language material and the subject before they begin to write about it. They should then read each other's work, and they may discuss their work. Thus they can get reading practice that concentrates on meaning.

A good teacher might carry the matter further by writing an account of a completely different playground. Before the children read it he may ask, 'What is the difference between this playground and yours?' or, 'Can you tell where this is?' The pupils must therefore look for a special piece of information. Or he may say, 'Read that as fast as you can.' Afterwards he asks the children questions to see how much they have understood and remembered. In any case, unless the children are reading entirely for their own pleasure (which they should often do), he will always ask questions or open a discussion to emphasise that reading is getting information and ideas and not just empty words. *Obviously most of this reading will be silent reading.*

Most of the extra time needed for teaching English in Primary 1, 2, 3 and 4 will be saved by teaching the other subjects in the mother-tongue.

The actual amount of practice of English will be much greater than before, if the new English courses are used. Follow suggestions given in them, and those given here, for practice in pairs and groups and in all practical work.

By this procedure the learning of English will not be spoiled by premature attempts to use it for teaching. On the other hand, there should be more understanding, more independent and original work, and less parrot learning in all subjects.

Multi-language schools

In schools where there is no one home language, it becomes necessary to establish a school language. This may be Swahili, or Hausa, or English. Whatever it is, the basic principle should be: *Much speaking and listening with activity of all kinds, before any attempt is made to teach children to read or write in the language.* Then introduce written language, using well-known or important words, such as the children's names, short notices such as STAND UP, etc. Then should come the combined writing and reading by children of their own words with the teacher's help, which is the beginning of 'experience reading'. Teach from simple books using words and ideas that are both well-known.

In this way children move naturally into the use of writing and reading to give and get thoughts. They meet a few difficulties at a time but go on from success to success, enjoying speaking and reading all the way.

Enjoyment is the main factor in keeping children working and developing in language. While children continue to enjoy language there is always hope, but if they do not enjoy it they will tend not to use it, and then there can be no hope of much improvement.

ARITHMETIC

Arithmetic is a way of thinking about quantities and it is a part of our language for communicating our thoughts about quantities. The special advantage of arithmetic is that it is precise—When a boy says, 'I have more money than my brother', no one knows precisely what he means. When he says, 'I have ten shillings more than my brother' we do know, precisely, what he means.

Arithmetic was developed to deal with the everyday problems of life such as keeping a check on a flock of sheep. But some men soon found arithmetic interesting in itself. For them arithmetic was an intellectual game, like chess, and in playing with numbers they found out how to handle them and how to use them more effectively in everyday life.

Today arithmetic is such a useful tool that everybody needs it and every country is finding that it has not enough people who are good at arithmetic.

Every country needs more children who are good at arithmetic, who enjoy it, understand it, want to learn more of it, and look forward to going on to learn other branches of mathematics. But there are not enough such children. Too many children are weak at arithmetic, dislike it, and are afraid of mathematics.

The reasons for this are easy to find. Turn to chapter 4, read again our remarks about the basic needs, and think how many children are able to satisfy these needs in their arithmetic lessons. To improve the situation, we must give careful thought to our principles of education and see that our teaching of arithmetic is in line with them.

And this, as we said in chapter 4, means that children must get success and must feel that they are contributing to the success of their group.

Children get success in a subject like arithmetic by being given work they can do—not easily, but with not too much effort. They need work of the right intellectual level, and they need amounts of work they can deal with. This does not mean children must never get a sum wrong, but it does mean they should get most sums right. When they are confident of their ability to cope with arithmetic, it is well to keep the goal a little ahead, for children need something to work towards.

We should be quite clear, however, that all cannot work towards the same goal. Teachers must arrange for children at different levels to have different work. Children who have been sick, or who have gaps in their knowledge for other reasons, should have special teaching, so that they do not give up hope and drift further and further behind the top third of the class.

The teacher's problem is how to do all this. We do not suppose that it can be done perfectly for every child, but we do think it is possible to go a long way towards it. Here we make suggestions for the beginnings, for teaching new processes, for teaching table facts, for maintaining skills, and for using arithmetic in other subjects.

The Beginnings: Activity and Experience leads to understanding

From the beginning the modern arithmetic teacher tries to help his children *to understand* before he requires them to memorise number facts or to practise processes. This is because the research of the last forty years shows that children like and learn and use arithmetic better if they understand it first.

It is equally clear that understanding depends first on *maturation and active experience*, and second on *purpose* and on *talking about the work*. Here we mean talking by the children, not talking by the teacher.

Here is a small experiment you may carry out to see how maturation and experiences are necessary for understanding the simplest ideas about quantity. Try the experiment with children of different ages, from 5 years to 7 years. If possible, try it also with the same child once a month over a long period of time.

Put out some seeds in a short line and then ask the child to put out the same number of blocks, one block for each seed, as below:

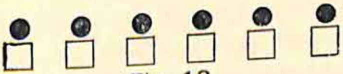


Fig. 12

Now ask, 'Are there more seeds or more blocks, or are they the same?'

If the child says 'more' or 'less' you need go no further, for obviously he does not understand. If he says, 'They are the same', spread out the seeds like this:

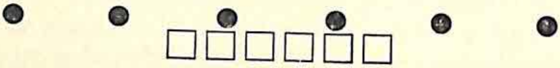


Fig. 13

Then say, 'Are they still the same?'

You will find that most children below six years say that now there are more seeds. The seven-year-old is almost certain to say, 'Still the same'—and he will think the question is a foolish one. But some others, between five and seven, will say 'More seeds' but will hesitate.

Now put the seeds in these patterns and ask, 'Are they the same?'

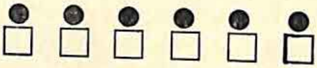


Fig. 14

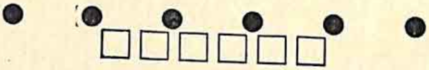


Fig. 15

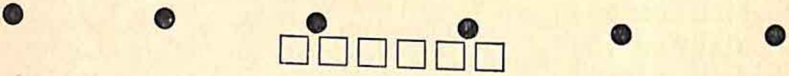


Fig. 16

You may find a child who will be sure the groups in Fig. 14 are the same. He may think they are still the same in Fig. 15 but that in Fig. 16 there are more seeds. These results show that young children judge the quantity of a group by its size. The teacher's task is to give them experiences that will help them to appreciate that the quantity of a group does not change when its shape or pattern changes. At the same time the children learn more words to use when talking about quantities, and these include the counting numbers.*

The teacher's problem is to give the children new kinds of experiences as they need them, and avoid emphasising numbers and counting until the children are ready to use numbers with understanding. Numbers are names for groups. If children cannot handle groups with understanding, we can be sure they are not ready to use the number names that go with the groups, for these names would be empty of meaning. It does not help a child to repeat one, two, three, four, five, etc., if he does not know what four or five means. But *as he comes to know* it does help to use the names. We should not use the names with no understanding, but we need not wait for full understanding.

The experiences teachers should begin with are these:

1. Classifying and sorting materials of many sorts by size or by colour. The materials may include seeds, leaves, buttons, bottle-tops, counters, sticks, blocks, beads, fruits, pieces of cloth, calabashes, tins, etc.
2. Building with blocks and lengths of wood, to develop ideas of size, equality and shape.
3. Play with water, sand, tins, calabashes and buckets to develop ideas of quantity.
4. Making steps, ladders, towers, with blocks and sticks, to develop ideas of order.
5. Putting sticks or rods or patterned cards in natural order, i.e. order of size.
6. Matching groups of objects, one to one.
7. Matching objects to patterns, then using the objects to make new patterns.
8. Separating patterned groups into parts. Then seeing that the parts together equal the whole group.

---

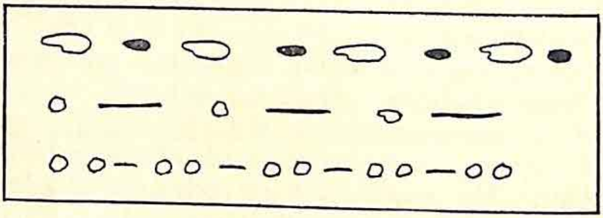
* For further information on the early development of children's ideas of quantity and number see: *The Child's Conception of Number* by Jean Piaget, (Routledge and Kegan Paul, 1952) and, for easier reading: *Counting and Measuring* by E. Churchill (Routledge and Kegan Paul, 1961). *Some Aspects of Piaget's Work* by Lawrence, Theakston and Isaacs (National Froebel Foundation, London).

In practice, if there are blocks and building materials—sand, water and tins—the children will quickly begin to use these for their own purposes. They can have some periods of free play which the teacher observes. But if there are only a few materials, such as seeds and bottle-tops and sticks, the teacher will probably have to make suggestions immediately.

She will set the children to work:

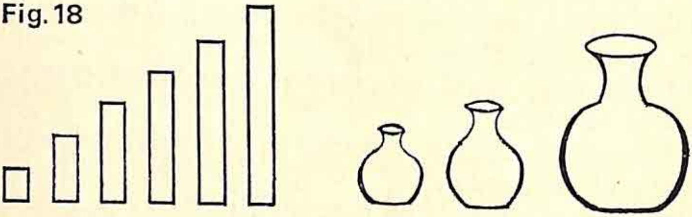
1. Sorting by colour or by size.
2. Matching groups of seeds with groups of bottle-tops.
3. Making patterns as in Fig. 17.

Fig. 17



4. Arranging objects in order of size as in Fig. 18.

Fig. 18



5. Matching patterns with counters and arranging patterned cards in order of size as in Fig. 19.

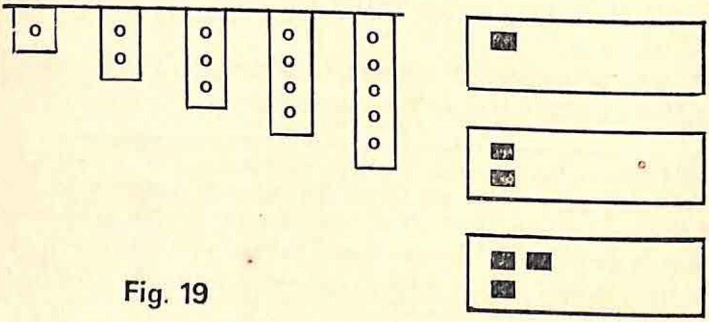


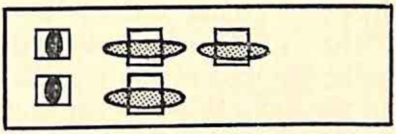
Fig. 19

We may note here the following steps as the teaching progresses.

1. The teacher's first task is to find out what the children can do, what they understand, what words they can use.

Then she tries to arrange groups of about six children who can do the same sort of thing. One group may be playing with blocks, another sorting coloured beads, another matching seeds, another making patterns from sticks of different lengths, another filling and emptying tins with sand or water. Another may be matching pattern cards with bottle-tops, and then separating the finished pattern into smaller groups, by using bottle-tops for one part and seeds for the other parts. See Fig. 20, which shows that a group of 2 and a group of 3 make another group of 5.

Fig. 20



2. As the children work at these 'games', they learn ideas of quantity and also the words with which to talk about those ideas. The teacher goes around looking at the children and asking questions like, 'Who has enough? Who has a big one? Which is the smallest? Who has a pair? Is this bigger? Is this the same? Who has a few? Which is the small end? Which is the middle one? Which is next to the end?'

3. Gradually the teacher introduces more number words. Who has *one*? Which comes *second*? As she does this, she notices which children are ready for a new activity.

4. As the children learn to do the activities and use the words, the teacher moves them from one activity to another. Because some children learn very fast, they will move on from one group to another so the groups will not remain the same.

Always the teacher tries to provide each child with the right task, so that he has always something new and interesting to do. But to do a task a few times may not be enough, and often a child may have to go back to a task, so that he can again discover an idea he has half forgotten.

5. While all this is going on, some of the children may also be learning the names of the counting numbers by rote, that is, without understanding them, but simply by hearing them. In any first year classroom there will usually be some more mature children who can count with a certain amount of understanding before they come to school. These children, with their teacher, will count out loud the number of children in their group, the number of objects on a table, and so on. They may recite number rhymes, and they may recite the number names up to ten or twenty for the pleasure of showing how much they know. There is no need either to stop this or to emphasise it, so long as the activities with groups of things are given first place in the early stages. There will be a back and forth development between learning number names and learning the meaning of numbers, and this is the beginning of arithmetic in the primary school.*

Structured Apparatus

As we have said, the great emphasis of modern arithmetic teaching is on understanding based on experience. In the last forty years we teachers, with the help of men like Jean Piaget, have begun to realise what is involved in teaching young children to understand arithmetic.

Probably the most important practical development during this period has been the use of 'structured apparatus'. Structured apparatus is designed to make the meaning of numbers and of processes clear to children, by giving them experience with materials that represent the structure of the number system and the relationships between numbers and processes. Perhaps the best known sets of structured apparatus are those of Cuisenaire, a Belgian, and Stern, an American.**

---

* One of the most useful books on the beginning of arithmetic is *Suggestions for Teaching Arithmetic in Infant Classes* by J. J. Lee, obtainable from The Government Printer's Shop, Wellington, New Zealand.

** See (1) *Numbers in Colour* by G. Cuisenaire and C. Gattegno (Heinemann, 1958) and *Mathematics with Numbers in Colour*, Books 1, 2, 3 (revised edition, 1963) by C. Gattegno, obtainable from the Cuisenaire Co., Reading, England. (2) *Children Discover Arithmetic*, C. Stern (Harrap, 1953).

There are many other sets of structured apparatus and many variations of each item. In addition to the seeds and bundles of sticks commonly used in African schools we suggest the following as most useful.

1. *Cuisenaire rods.* You cannot make them locally because they must be very accurate. Six sets would be needed for an infant room. Although expensive, these are well worthwhile for a teacher who is prepared to learn how to use them.

2. *Pattern Boards.* These can be made by drawing squares on cardboard from beer cartons, or on thin wood. Make half-inch squares. You need ten sets of patterns and plenty of small blocks coloured black and red on two sides, natural colour on all other sides. The cards are like this, from one to ten.

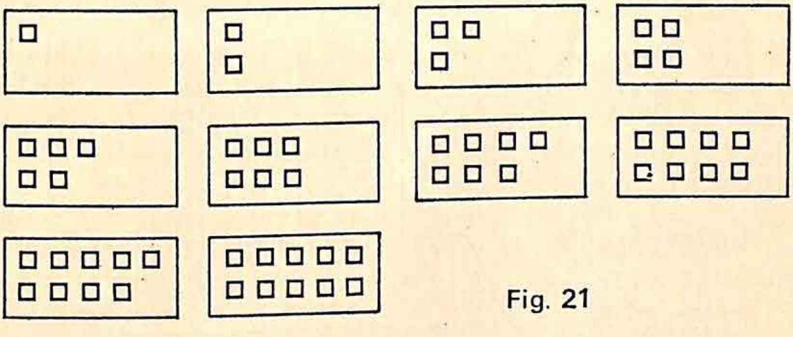


Fig. 21

First they can be used for matching patterns, one block to one square; then for ranging in order from one to ten. Then they can be used for identifying numbers by counting the blocks and putting on a number card as in Fig. 22. These boards emphasise the odd and even aspect of number, and the 'one more' relationship of numbers in natural order of size.

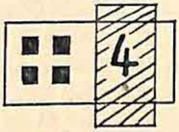


Fig. 22

Then the cards can be used for separating the groups into smaller groups and seeing that these make up the whole group. This is basic to adding and subtracting. (See Fig. 23.) This shows that two and two are four.

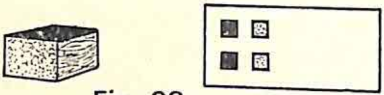


Fig. 23

With pattern boards children can discover all the number facts up to 10, and then up to 20.

3. *The open abacus*, made from a piece of board with three straight rods and some rings sawn from bamboo, or cut from a piece of plastic hose pipe (Fig. 24).

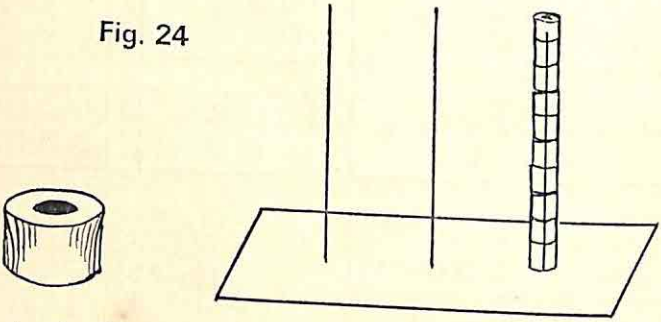


Fig. 24

The rods should each carry ten rings, with the tenth one only half on. The main use of the abacus is to teach place value and the adding or subtracting of numbers where tens and ones, or hundreds and tens must be exchanged.

4. *The place-value board.*

(a) This can be made large, from a piece of 3-ply wood, 24 by 30 inches. Paint it black to take chalk. Nail two pieces of wood across to hold counters. The counters may be strips of card or small pieces of wood. This big board is best for use with a class or a group of children. It is used leaning against the wall.

Here, in Fig. 25, we show the meaning of $25 + 36 = ?$ The children set the sum out. Bring the ones together. Exchange ten ones for one ten, and put the whole in the answer. They may write with chalk on the same board to show what any example means in figures.

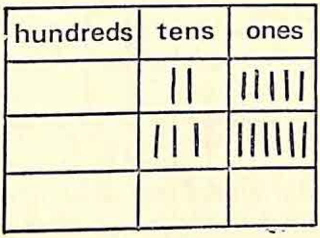


Fig. 25

In the subtraction sum in Figs. 26 and 27 they show that when we take 22 pigs from a group of 43 pigs the number left is 21.

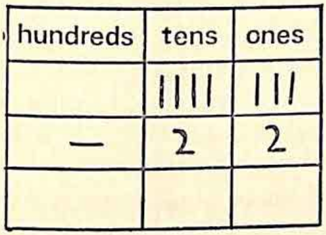


Fig. 26

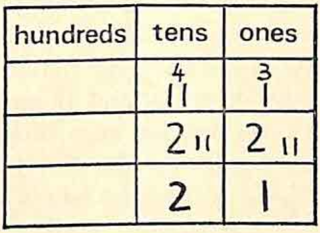


Fig. 27

This kind of apparatus both represents what happens in working the actual problem and emphasises the structure of the number system and the meaning of the process.

(b) Small place-value boards can be made from the sides of cartons. Lay them flat on the desks and draw the lines with chalk or ink. Use small sticks for counters. Two or three children at a time can use such a place-value board to set out a problem and find out how to solve it.

As you read this, set yourself or your friends simple problems and then see how each sets it out and works it out. From this simple exercise you will soon see the value of a place-value board for helping young children to understand their work.

Begin with the subtraction examples in Fig. 26. You will find most students set it out as in Fig. 28.

<table>
<tr><th>hundreds</th><th>tens</th><th>ones</th></tr>
<tr><td></td><td>||||</td><td>|||</td></tr>
<tr><td>—</td><td>||</td><td>||</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

Fig. 28

But this shows 65 pigs altogether, although there were only 43 to start with! It cannot be right. So what must we do?

Finally, we must point out that even the poorest school can have this one piece of apparatus if no other, for if there are no cartons it can be drawn with chalk on a desk top, or scratched with a finger on the sand of the desert.

These, then, are the most useful and cheapest pieces of structural apparatus. They do not do away with natural materials like pebbles or seeds, and there are plenty of other useful ones, but unless the teacher uses these, or substitutes for them, it will be much harder for the children to grasp their work.

Perhaps the most important thing for teachers to learn about number apparatus is that they, the teachers, have to learn patiently how to use it. It takes time to learn to use apparatus, and although a book can help, you must remember that you too need experience and a purpose in using the apparatus before understanding of its value can develop in your mind. Therefore you must not merely 'experiment' once or twice, but persevere.

Teaching a new process—addition with carrying

We will use an easy example (teaching two column addition with carrying) and a harder example (teaching division with fractions).

This is how Mr. Okola taught two column addition with carrying.

Step 1. He gave a problem without carrying, to remind the children of work they already knew and to keep the practical use of arithmetic before them. He used an example close to their experience. He said, 'Chief Kwale had 18 goats. He bought 11 more goats. How many did he have? What must we do to find out?'

The children replied, 'We must add.'

Then the children set out the example below.

$$\begin{array}{rl} 18 & \text{goats} \\ \underline{11} & \text{goats} \\ \underline{29} & \text{goats} \end{array}$$

They all got it right.

Step 2. He gave another problem containing the new difficulty. 'Chief Johnson had 18 goats and he bought 18 more goats. How many did he have then?'

The children set the example out and the teacher went round to see what they were doing. Here below is what he saw on many books.

$$\begin{array}{rl} 18 & \text{goats} \\ \underline{18} & \text{goats} \\ \underline{216} & \text{goats} \end{array}$$

Step 3. He said, 'Goodness me, that is a lot of goats. Let us see how many that would be.' He showed the children his hundred board. (See Fig. 29 on page 148.)

'Here is one hundred. Show me the first 18.' A child showed this. 'Do you think another 18 would use all this board?' No, the children did not. 'Then do you think 216 could be right?'

'No.' 'Then what is the trouble? Let us look.'

He then wrote on the board as below.

$$\begin{array}{r} 18 \\ \underline{11} \\ \underline{29} \end{array} \qquad\qquad \begin{array}{r} 18 \\ \underline{18} \\ \underline{} \end{array}$$

Then he asked what was the difficulty. These children had used apparatus before. They had an abacus, a place-value board, and bundles of 10 sticks. They knew about tens and ones. They told Mr. Okola that 8 and 8 was more than 10. That was the difficulty.

Fig. 29

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Step 4. 'Very good,' said Mr. Okola. 'Now see if you can find a way of doing this sum. You can do it any way you like.'

Some children used the abacus, some used the place-value board. Some used pencil and paper. They all found the answer.

Mr. Okola let every child who found the right answer explain his method. Many used the same methods, and actually only six methods were written on the blackboard. These were:

(i) $10 + 10 = 20$, and $8 + 8 = 16$.
Put down 20
Put down $\underline{16}$
$\underline{36}$ goats

(ii)

$$\begin{array}{r}18\\ \underline{18}\\ 16\\ \underline{20}\\ \underline{36}\end{array}$$

(iii)
$18 + 10 = 28$
$28 + 2 = 30$
$30 + 6 = 36$

(iv) $18 + 2 = 20$
$20 + 10 = 30$
$30 + 6 = 36$

(v) $18 + 2 = 20$
$20 + 6 = 26$
$26 + 10 = 36$

(vi) 18, count on another 18 with strokes.
18 + 11111 11111 11111 111
This gives you 36.

Mr. Okola said all those methods were quite good. Then he set up the place-value board as in Fig. 30, and worked the sum through with the class, finishing by exchanging 10 ones for a ten. At the end the board looked as in Fig. 31.

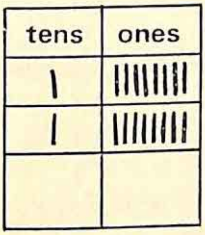


Fig. 30

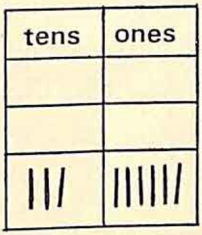


Fig. 31

Then they did the same thing using numbers on the blackboard. They soon saw that this was what the children in methods (i) and (ii) had done, but that they need not have used as many figures. At the end of this day's lesson the blackboard looked as below.

$$\begin{array}{ccc} 18 & 18 & 18 \\ \underline{18} & \underline{18} & \underline{18} \\ 16 & \underline{36} & \underline{36} \\ \underline{20} & 16 & 1 \\ 36 & 20 & \end{array}$$

Step 5. Then Mr. Okola said, 'Which method is quickest to put down?' The children agreed that the last method was the best. Mr. Okola let them copy it down.

That was the end of that lesson.

Step 6. Next day Mr. Okola started the class working by getting them to explain to him all the figures which he put on his blackboard at the end of Step 4 (page 149). He made the slow children show him the meaning with the place-value board.

Step 7. Only then did he let them begin to practise. The first practice examples were:

$$\begin{array}{ccccc} 16 & 17 & 19 & 28 & 26 \\ \underline{16} & \underline{17} & \underline{19} & \underline{28} & \underline{36} \\ \underline{} & \underline{} & \underline{} & \underline{} & \underline{} \end{array}$$

Mr. Okola used these examples because they were easy. The children could give all their attention to the new process.

Step 8. When the children were familiar with the process he gave harder examples like:

$$\begin{array}{ccccc} 18 & 26 & 29 & 28 & 39 \\ \underline{27} & \underline{37} & \underline{18} & \underline{26} & \underline{29} \\ \underline{} & \underline{} & \underline{} & \underline{} & \underline{} \end{array}$$

He let the quick children do many examples, but he walked around the class all the time. When he found a child looking puzzled, he asked that child to explain his sum. Sometimes he had to go back to the place-value board to be quite sure the child understood. Very soon all the children understood perfectly how to do the sums.

Step 9. Mr. Okola's next problem was to get the children to work quickly. Each child had to do as many sums as he could get right in three minutes.

The children all started together and all stopped together. Then they marked their own sums while Mr. Okola called out the answers.

Each wrote his score down.

Step 10. After that, every day, Mr. Okola gave three-minute tests. The same sums were used in different order.

The children copied down the sums before they started to work. This took a long time—more time than the working—and he wished he could find a way to save this time.

Step 11. After one week Mr. Okola gave his three-minute tests only once a week. The children kept the scores to see if they were getting faster.

Step 12. At every practice Mr. Okola gave one practical problem to keep the children's minds on the actual use of their arithmetic.

Comment on Mr. Okola's teaching. This method of teaching a new process may seem slow, but it is thorough. All the children understood it and could explain it. The understanding was followed by effective drill, which had a purpose—more speed—and the results were recorded so that each child could see his own progress.

Mr. Okola began with the children's own social experience. They talked about the problem, isolated the special arithmetical difficulty, and got their purpose clear at each stage.

The children had a chance to explore and discover, working as individuals. Each was able to use his old experience in his own way to deal with this new problem, so here there was a chance to develop independent thinking. Then they explained or shared their thinking. Here, they, and the teacher, had to be open-minded and tolerant about different methods. They decided which of the many methods was best, thus having practice in critical evaluation. They practised the best method and each was given help by the teacher if he needed it.

Finally, in their drill, they marked and recorded their own work. In this way every child could practise being honest, although the teacher checked too; and every child could both get some success and try to beat his own score next time.

In his procedure Mr. Okola tried to take notice of the aims and principles of education. Did he succeed? Did he give the children a chance to satisfy their basic needs?

Could we say they had a chance to satisfy the need to be creative?

Teaching a new process—division with fractions

We use this example because it is often thought too difficult for children to understand. The result is that few children (or teachers) know what they are doing in division with fractions. But it is not too hard if we take one difficulty at a time.

We shall begin with the meaning of division problems with fractions. Then we shall try to find the rule or process by observation in simple cases. Then we shall try to see why it works. Then we shall use it for varied examples. All the time we shall be careful not to lose sight of what we are trying to find out in doing such sums and what the answer means.

Step 1. We shall best see the meaning of division sums with fractions if we move from practical examples to the written arithmetic.

Here are some examples that children may work out practically.

(a) A boy has 6 pounds of beans in a bag. How many $\frac{1}{2}$ pounds are there in his bag?
(b) A boy has 6 pints of water in a tin. How many $\frac{1}{2}$ pints can he pour out for drinks?
(c) You all have 6 inches on your rulers. How many $\frac{1}{2}$ inch pieces could you mark off from 6 inches?

A good teacher will make his children find the answers practically to each of these. He may give many similar examples using other numbers.

He must ask the children what they have to find, and what the answer is for each sum. This helps the children to see the meaning of the problem. He must discuss their answers until they use always this form or something like it:

> How many half pounds in six whole pounds? There are 12 half pounds in six whole pounds.
> How many half inches can I cut off from six whole inches? I can cut off 12 half inches from six whole inches.

He can thus be sure that they understand the work so far.

Step 2. We now ask the children how to write these examples using figures. If they are puzzled give them a model with whole numbers, e.g. 'How many 2 inch pieces in 16 inches?'

They may write this

$$\begin{array}{r} \text{8 pieces} \\ 2\,\overline{)\,\text{16 inches}} \end{array} \quad \text{or} \quad \begin{array}{r|l} 2 & \underline{\text{16 inches}} \\ & \text{8 pieces} \end{array} \quad \text{or} \quad 16'' \div 2'' = 8 \text{ pieces.}$$

The teacher will agree that these are all correct. The teacher should then let the children write their fraction divisions in the same way, e.g.

$$\begin{array}{r} \text{12 pieces} \\ \tfrac{1}{2}\,\overline{)\,\text{6 inches}} \end{array} \qquad \begin{array}{r|l} \tfrac{1}{2} & \underline{\text{6 inches}} \\ & \text{12 pieces} \end{array} \qquad 6 \div \tfrac{1}{2} = 12 \text{ pieces.}$$

They already know the answers from practical work. What they have to do is to read these examples in words and explain the meaning in words.

In every case the sum can be read—Six inches divided by one half inch? or *How many* half inch pieces in 6 inches? and the answer will be: 12 pieces, or, more fully, 12 half inch pieces.

When the children have done this with several examples the teacher may say, 'With fractions, we usually write in this form:'

$$6 \div \tfrac{1}{2} = 12$$

Then, immediately, he will ask, 'What does that mean?' He should not be satisfied till he is told, '*How many* halves in 6? There are twelve halves in 6.'

Note the procedure carefully: each child should read the original question in full.

Work it practically. Write the answer in full, in words.

Then write the sum in figures using the form $4 \div \frac{1}{2} =$

He must read the sum beginning: 'Four divided by a half, and continuing, 'It means: "*How many halves in four?*"'

Then he may say the answer, 'Eight halves in four.'

The teacher must emphasise that we can only know the meaning of the answer if we remember the original question, which is always: How many of $\boxed{\text{one quantity}}$ in $\boxed{\text{another quantity}}$?

This is the end of the first lesson.

After this work the children should understand the *division problem* and its arithmetical form. Next they must learn to use and understand *the division process.*

e.g. $\frac{3}{4} \div \frac{1}{2}$ means how many $\boxed{\tfrac{1}{2}\text{ s}}$ in $\boxed{\tfrac{3}{4}}$

$2\frac{1}{2} \div \frac{1}{3}$ means how many $\boxed{\tfrac{1}{3}\text{ s}}$ in $\boxed{2\tfrac{1}{2}}$

Step 3. Set out some easy divisions. Let the children find the answers practically and write them down. They then have a page like this:

$8 \div \frac{1}{4} = 32$ quarters
$3 \div \frac{1}{4} = 12$ quarters
$1 \div \frac{1}{4} = 4$ quarters
$2 \div \frac{1}{3} = 6$ thirds
$6 \div \frac{1}{2} = 12$ halves.

Step 4. Then the teacher may ask, 'Can you see any rule for getting these answers?'

The teacher must let the children talk about this question. Usually they will see that 8×4 is 32, 3×4 is 12, and so on. They will tell the teacher.

The teacher will reply, 'Let us write this down and see if it works.'

What you say is that $8 \div \frac{1}{4} = 32$
and that $8 \times 4 = 32$

Then, making use of what the children learned in multiplying fractions, he says, 'In fraction form this means that

$$\frac{8}{1} \div \frac{1}{4} = 32$$

$$\text{and } \frac{8}{1} \times \frac{4}{1} = 32$$

$$\text{so } \frac{8}{1} \div \frac{1}{4} = \frac{8}{1} \times \frac{4}{1}$$

'Do you agree?'

When they do agree the teacher can proceed.

Step 5. Let us see if it works with other cases. We will do the sums this way, and then check them practically. The teacher then sets more sums such as:

$$6 \div \tfrac{1}{3} = \qquad 8 \div \tfrac{1}{2} = \qquad 3 \div \tfrac{1}{3} =$$

The children write these:

$$\frac{6}{1} \div \frac{1}{3} = \frac{6}{1} \times \frac{3}{1} = 18 \text{ thirds.}$$

$$\frac{8}{1} \div \tfrac{1}{2} = \frac{8}{1} \times \frac{2}{1} = 16 \text{ halves}$$

$$3 \div \tfrac{1}{3} = \frac{3}{1} \times \frac{3}{1} = 9 \text{ thirds.}$$

They read the sums, beginning, 'How many . . .?' They prove that the answers are right.

The teacher again says, 'Couldn't we make a rule about this?'

The children may try to make a rule, and they will probably say, 'When we divide with fractions we put the sum down in fraction form. Then we multiply by the divisor turned upside down.'

This is very clumsy, *but it is right.* The teacher must be very pleased to get such an answer. He may now say, 'Let us see how the book puts it.'

So at last the children get the formal rule: 'Invert the divisor and multiply.' This ends the second lesson.

They have observed that the rule works. But they do not yet know why it works.

Step 6. The teacher helps them to see this with a new problem:

How many quarters in *any number*?

How do we find out?

How many quarters in one? How many in two?

Very soon the children say, 'To find how many quarters in any number we multiply by 4.'

'That is right,' says the teacher, 'and in fraction form, 4 is "four over one".'

So now we can see why we invert and multiply. Look below.

$$\boxed{\text{A number}} \div \frac{1}{4} = \boxed{\text{A number}} \times \frac{4}{1}$$

Let us test it.

$$\frac{4}{1} \div \frac{1}{4} = \frac{4}{1} \times \frac{4}{1} = 16 \text{ quarters.}$$

$$\frac{2}{1} \div \frac{1}{4} = \frac{2}{1} \times \frac{4}{1} = 8 \text{ quarters.}$$

$$\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2 \text{ quarters.}$$

'Is that right?—How many quarters in a half?'

'Two.'

'Then it *is* right.'

'Let us do some more.' The teacher then sets many more examples such as:

$$\tfrac{2}{3} \div \tfrac{1}{3} \quad 8 \div \tfrac{1}{4} \quad 3 \div \tfrac{1}{5} \quad \tfrac{3}{5} \div \tfrac{1}{5}$$

This ends the third lesson.

Step 7. At the next lesson we revise our rule: To divide with fractions, we invert the divisor and multiply.

Let us see if we can do it today. We set examples such as:

(a) $3 \div \frac{1}{2} =$ (d) $8 \div \frac{1}{5} =$
(b) $4 \div \frac{1}{4} =$ (e) $6 \div \frac{3}{4} =$
(c) $7 \div \frac{1}{3} =$ (f) $4 \div \frac{2}{5} =$

If the children are puzzled at (e) and (f), we merely say, 'Follow the rule. See what you get. Then we will see if it works with sums like this.'

When the children have worked the sums, we check their answers practically, by measuring off $\frac{3}{4}$ inch lengths from a 6 inch length.

When they are satisfied the rule works, we let them practise with more examples of the same kind.

Step 8. Now we must ask, 'How does this in fact work?'

$$6 \div \tfrac{3}{4} = \frac{6}{1} \quad \frac{4}{3} = 8$$

We know it does work—but how? Let the children try to explain. Give them time and they will tell you, quite soon, that they multiply to find how many quarters, and then divide to find how many $\frac{3}{4}$s.

Let them work and explain other examples.

This ends the fourth lesson.

Step 9. Using the rule in all types of examples, in the next lesson we give a mixture of examples such as:

$$2 \div \tfrac{1}{4} = \qquad 1 \div \tfrac{1}{4} = \qquad \tfrac{1}{2} \div \tfrac{1}{4} = \qquad \tfrac{1}{4} \div \tfrac{1}{4} =$$

$$2\tfrac{1}{2} \div \tfrac{1}{4} = \qquad 1\tfrac{3}{4} \div \tfrac{1}{4} = \qquad 3\tfrac{3}{4} \div \tfrac{3}{4} = \qquad 12\tfrac{1}{2} \div 1\tfrac{1}{2} =$$

The children have to learn two things:

(i) To set each sum out in fraction form, and then follow the rule.

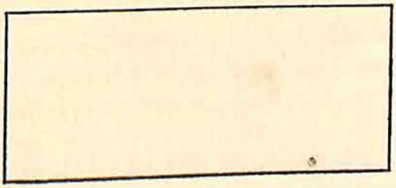
(ii) To grasp the meaning of the answer, we must say the question in full, then say the answer in full. And if it is hard to understand draw a diagram.

Thus, in $\frac{2}{3} \div \frac{1}{4}$

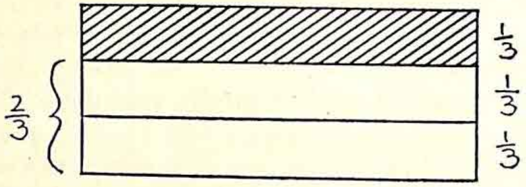
We get $\dfrac{2}{3} \times \dfrac{4}{1} = \dfrac{8}{3} = 2\tfrac{2}{3}$

What does it mean? We can use a diagram to help explain.

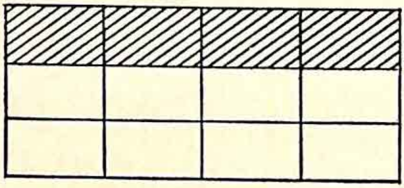
(a) We draw a whole figure, 6 inches by 3 inches, thus:



(b) We divide it into thirds, so that we can see $\frac{2}{3}$ of our figure, left unshaded thus:

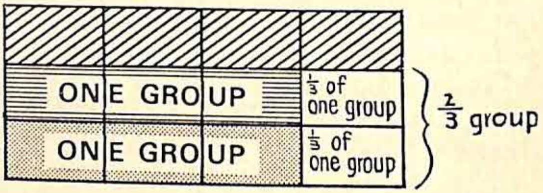


(c) We divide the whole figure into quarters, thus:



Each quarter consists of 3 of our rectangles.

(d) We now have to ask how many groups of 3 rectangles there are in the unshaded part. There are 2 groups of 3 rectangles, and 2 rectangles left over, i.e. $\frac{2}{3}$ of a group.



Total $2\frac{2}{3}$ groups

(e) This shows that if we ask how many $\frac{1}{4}$s in $\frac{2}{3}$, we find that there are $2\frac{2}{3}$ quarters in $\frac{2}{3}$ of one whole.

These diagrams prove our rule has worked correctly. Another way to make this sort of practical check is with length. We measure off $\frac{2}{3}$ inches and then find how many $\frac{1}{4}$ inches that is.

Of course measurement of this sort is much more difficult than calculation, as the children will find out by experience. This is useful. Children should learn that thinking with numbers can be precise, but measuring is always approximate.

The lesson now proceeds with more examples including the kind of practical problem we began with. Understanding will not yet be complete but it will be well started.

Some practical work is best done with glass measures and water. Consider the meaning of such examples as: How many half pints can we take from a quarter pint?

This is written $\frac{1}{4} \div \frac{1}{2} = \frac{1}{4} \times \frac{2}{1} = \frac{1}{2}$

and is answered: We can take half of a $\frac{1}{2}$ pint from a quarter pint.

This is shown easily with glasses and water. Even so, many people do not see how you can divide a small quantity or number by a larger quantity or number. These people may find it useful to work out and discuss a series such as:

$$4 \div \tfrac{1}{2} = \frac{4}{1} \times \frac{2}{1} = 8 \text{ halves in four}$$

$$2 \div \tfrac{1}{2} = \frac{2}{1} \times \frac{2}{1} = 4 \text{ halves in two}$$

$$1 \div \tfrac{1}{2} = \frac{1}{1} \times \frac{2}{1} = 2 \text{ halves in one}$$

$$\tfrac{1}{2} \div \tfrac{1}{2} = \tfrac{1}{2} \times \frac{2}{1} = 1 \text{ half in a half}$$

$$\tfrac{1}{4} \div \tfrac{1}{2} = \tfrac{1}{4} \times \frac{2}{1} = \tfrac{1}{2} \text{ of a half in a quarter}$$

$$\tfrac{1}{8} \div \tfrac{1}{2} = \tfrac{1}{8} \times \frac{2}{1} = \tfrac{1}{4} \text{ of a half in an eighth}$$

The slow pattern of learning we have here suggested, moving from experiences to numbers and back, is particularly valuable for difficult processes like this. We emphasise the need to take time, to give children a chance to think about their work.

We are well aware that most of you who read this book were taught the process in half the time—but did you understand it?

You should now carefully study again these suggestions to see how they line up with our principles

Compare this teaching with Mr. Okola's. It is different in detail. Is it the same in principle?

Teaching Table Facts

In teaching the tables, whether of addition or multiplication, efforts to develop understanding and to memorise the details should follow and support each other. We expect to get more and more understanding and also more and more facility as time goes on.

We do not deal with all tables in the same way. For example, when we build up the 2 or 3 times tables we use counters and we may develop tables and charts that show these counters, thus:

2 × 1 = 2 ⁚ and 1 × 2 = 2

2 × 2 = 4 ⁚⁚ and 2 × 2 = 4

2 × 3 = 6 ⁚⁚⁚ and 3 × 2 = 6

And we may show our children that the number picture ⁚⁚⁚ can be thought of as 3 times 2 ⁚|⁚|⁚ or it can be a picture of 2 times 3 $\frac{\bullet\bullet\bullet}{\bullet\bullet\bullet}$

They should know that ⁚⁚⁚ can mean 3 × 2 = 6 or 2 × 3 = 6. Both are right. The picture can also show how many 2s in 6, and how many 3s in 6. We learn the division tables, at the same time as the multiplication tables.

Then when we have built up the tables in that way, perhaps taking three or four days to do it, we may say, 'Here is another way to show the 2 × table.'

1	2	3	4	5	6	7	8	9	10	11	12
⁚	⁚	⁚	⁚	⁚	⁚	⁚	⁚	⁚	⁚	⁚	⁚
2	4	6	8	10	12	14	16	18	20	22	24

We should talk about this a lot. It can mean $2 \times 1 = 2$, $2 \times 2 = 4$, $2 \times 3 = 6$ or it can mean, $1 \times 2 = 2$, $2 \times 2 = 4$, $3 \times 2 = 6$, or it can mean How many 2s in 2? One. How many 2s in 10? Five, etc.

The children and the teacher should talk about this table, and play with it, until they all understand it thoroughly.

Now the children have built up the table in two ways and have got a good deal of understanding. Most of the children now remember many of the facts. But they need to learn the table by using the facts. The best way of doing this is to provide cards with rows of numbers like this:

1	2	3	4	5	6	7	8	9	10	11	12
:	:	:	:	:	:	:	:	:	:	:	:
2	4	6	8	10	12	14	16	18	20	22	24

2	1	3	8	4	5	6	4	3	5
2	8	7	6	8	9	4	7	5	12
10	9	8	4	11	6	7	11	9	7
8	1	9	12	2	11	7	6	10	8

The children multiply each number on their card by 2. They may, and will, say either $2 \times 3 = 6$ or $3 \times 2 = 6$. It does not matter. With one finger they follow their card. They write the answers as rapidly as they can. They can look up to the table as often as they like. But always it is a race to see who can finish first in their group. Because the numbers repeat again and again the children soon learn them and do not bother to look up at the table, but some need the table much longer than others. This method of learning the table facts in random order, using many cards, is the most effective way of learning the tables. It allows each child to go at his own pace and to get everything right. It also spurs everyone on to do his best.

Children can be trained to mark their own or each other's work. As they get older, they can use larger cards and they can keep their own scores—the number right in, say, three minutes.

But with older children dealing with, say, the 7 × table, we do not use dots or counters. The children can build the table using figures, thus:

$1 \times 7 = 7$ and $7 \times 1 = 7$
$2 \times 7 = (7 + 7)\ 14$ and $7 \times 2 = 14$
$3 \times 7 = (7 + 7 + 7)\ 21$ and $7 \times 3 = 21$
$4 \times 7 = (21 + 7)\ 28$ and $7 \times 4 = 28$
$5 \times 7 = (28 + 7)\ 35$ and $7 \times 5 = 35$

At this stage to build the table with dots would be babyish. Even to use $7 + 7 + 7 + 7$ is rather immature. But $7 \times 4 = (21 + 7) = 28$ is much more mature.

The children should not be held back at the stage of counting by ones but encouraged to use more mature methods. At this stage different children may use different methods to build their tables. They can explain these to the class. The result is more interest and more learning.

Then the children can use the second form of the table thus:

7 ×	1	2	3	4	5	6	7	8	9	10	11	12	÷ 7
	7	14	21	28	35	42	49	56	63	70	77	84	

Now their practice cards need not have the table written on the top as with the 2 × table. It can be separate, and may be turned over or turned up.

Whatever table is being learned, the teacher must check the learning. After some days of practice with these tables and cards it will be time for diagnosis. The children can diagnose their own difficulties in two ways:

(a) They do a card such as this in which all the numbers appear several times.

3	2	4	5	1	6	7	9	8
5	6	8	4	9	7	8	10	7
12	11	10	7	9	8	7	5	3
4	2	7	3	9	12	8	7	9
8	6	1	0	3	5	4	2	8

They then multiply these numbers by the table they are learning. But they do not use the table card at all. They mark their answers, note their errors, and write them out to be learned.
(b) They use Solo cards, which are like this:

Front	Back
6 × 7 =	6 × 7 = 42

The player of Solo has a set of cards. He looks at the front, says the answer and turns the card. If he is correct he puts the card on his right, if he is wrong he puts it on his left. Then he learns the cards on the left. When he thinks he knows them he shuffles the cards and tries again.

In these ways each child finds his own errors and learns only what he does not know.

The teacher may also help the children to mark out the table they are learning on the hundred board thus:

1	2	3	4	5	6	⑦	8	9	10
11	12	13	⑭	15	16	17	18	19	20
㉑	22	23	24	25	26	27	㉘	29	30
31	32	33	34	㉟	36	37	38	39	40
41	㊷	43	44	45	46	47	48	㊾	50
51	52	53	54	55	(56)	57	58	59	60
61	62	(63)	64	65	66	67	68	69	(70)
71	72	73	74	75	76	(77)	78	79	80
81	82	83	(84)	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

They study the pattern and try to see why it comes out in this way.

The hundred board can be used like this for any table.

The teacher should also set out the table in this way:

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6					21					
4	8					28					
5	10					35					
6	12					42					
7	14	21	28	35	42	49	56	63	70	77	84
8	16					56					
9	18					63					
10	20					70					
11	22					77					
12	24					84					

Study and use all these devices and your children will understand and know their tables better. Is there, then, no place for repeating the tables aloud? No place for the number circle and so on?

Yes, there is a small place for these, but the devices we have shown are the most efficient. Remember, however, that the table practice cards should be different for different days so that children do not learn half a row of answers by heart. Remember, too, that these cards are most effective when used against time, which gives point to the effort to remember.

Give a set time for a card (perhaps three minutes). Let each child keep his score, e.g. the number right in three minutes, so that he can see his progress from day to day.

Finally, when a child seems to have trouble with a particular fact, such as 7 × 8 = 56, it is important to take that fact and study it. The child should go to great trouble to find it on the hundred chart, see it in relation to 7 × 7 = and 7 × 9 = and especially 6 × 9 = 54, the only other table fact in the fifties.

The little group of table facts from 7 × 6 = 42 to 8 × 8 = 64 are the most difficult of all tables below 100 for children to memorise. They need special individual attention. Study of them on the hundred chart will help.

This should be followed by fast practice using special cards.

	6	6	7	6	7	5	7	8
Key card	42	48	49	54	56	60	63	64
	7	8	7	9	8	12	9	8

	What are the factors of:					
Test card	42	49	56	63	64	48
	60	48	54	42	64	49
	63	66	49	63	60	42
	64	63	56	64	54	49
	60	64	63	56	54	49
	42	63	56	64	49	54

Two sets of cards, using the same numbers in different orders, will be enough. Those who need the practice may give it to each other, time each other, and call the answers to each other. Perhaps a half of most classes need this sort of practice.

Children may give the practice to each other orally, dictating from the key card: 6 × 7, 6 × 8, and then alternating numbers, 6 × 7, 7 × 7, or taking the numbers backwards, 8 × 8, 7 × 9, etc.

Will these procedures produce perfect results? No. But they will produce very much better results than the usual practices of today.

Best results will always come when the children are consulted about the problem: 'How shall we learn this table?' 'Shall we do it this way?' 'What shall we aim at this week?' 'Can we all raise our scores three points?' 'Can we try always to get 7 × 8 and 7 × 9 right?'

The best class we have ever seen worked in this way, and the children themselves asked for 'a tables club'. The club members met for half an hour twice a week, after school, to learn, practise and test their tables.

Maintenance

Most learning is soon lost unless it is used. Teachers need a planned programme to maintain skills and keep facts ready for use. This takes time from new work, but if the practices are carried out against time, with the deliberate intention of gaining speed, the new work will benefit because the children will be able to carry out the mechanical work easily, and the knowledge of past processes will be always ready for use. This implies that:

(1) Maintenance work scores must be recorded so that the children know that they are improving or that they need practice to catch up to their previous standard.

(2) The teacher plans maintenance tests to be of equal difficulty. This is best done at the time of learning. For example, the teacher should plan maintenance work in, say, the 7 × table, and have ready three equally difficult tests that he can give in turn. He can use these several times each and so he can tell whether the children are better or worse.

(3) Understanding is maintained—for example, the knowledge that zero in 70 × 7 means 'nothing to multiply in the ones column', and 'zero is a place holder'.

Maintenance work relies little on new *experience*, but greatly on *purpose*, for the children should know just what they are trying to do in maintenance tests or practices, e.g.: sharpen up old skills, find out what has been forgotten and needs more practice, raise standards of performance to a set standard.

Both children and teacher need to *evaluate* the results of their maintenance work. Just to do a few mechanical sums every day is not very effective unless we check, and decide what to work at next.

Much maintenance work is best done *in groups* of children who know they need to improve in the same kind of work. Our last word on maintenance in arithmetic is that it must not be allowed to take up too much time. We must look for ways of saving time. One saving of children's time occurs when they do not have to set out every sum but write only the answers.

Another very important saving occurs when they are allowed to do their work in pencil.

The rigid insistence on the use of pen and ink from primary 4 to primary 6 results in a loss of up to half the arithmetic time. No one understands any more because he writes in ink, but many children are made slow by being forced to use pens. This unfortunate survival from colonial times justifies us in proposing a new principle—the *principle of economy of children's time*. Any teacher who adopts this valuable principle will find it working in many of the suggestions made throughout this book, especially where we suggest work in groups, at the different levels of different children, and where we see different subjects in the one piece of learning.

Using Arithmetic in other subjects

Language is a tool we use in history or geography in order to carry on work in those subjects. Similarly arithmetic is a tool. We use it in science or geography to carry on work in those subjects.

It is true that by doing this we improve our language or our arithmetic but this improvement is a by-product and not the purpose of using arithmetic in another subject. We are never justified in sacrificing one subject to another. However, most subjects can be said to have this in common, that they are intended to help children to think better.

We wish to emphasise that the purpose of arithmetic is to enable men to think more precisely, and this should be required in many fields of work. But no one thinks or expresses himself precisely without a reason and this brings us to the question why, in a subject like, for example, nature study, any child should bother to think precisely. The teacher must provide a situation that requires it, and he must help his children to see that precision is needed.

Here is such a situation: Mr. Hussein asked his friend Mr. Nwoko to write him a letter asking if the children at Mr. Hussein's school would tell them if certain birds ever came to their village. Mr. Hussein wanted his children to do some nature study on migrating birds.

When the letter came it was addressed to the children of the school. Mr. Hussein read it to the children and put it on the notice board. They discussed the letter and agreed to watch out for the birds and write a little book about them.

One day a boy ran in to school on Monday morning and said, 'I saw the egrets the other day.' He had been away for a week. Mr. Hussein said, 'What shall we write in our book? Shall we write, "Ali saw the first egrets the other day"?

The children saw this would not do. It was not precise enough. Ali must say exactly which day. It was the 3rd of September. After that when they saw new groups of egrets they wrote the date.

Then they began to talk about big groups and little groups of egrets. Mr. Hussein asked what 'a big group' meant. Soon they saw they must count the groups because no one could agree what 'a big group' meant. Some said it meant 10, some said 20 or more. The only satisfactory way was to use numbers.

When they sent their book to Mr. Nwoko's school, they had the numbers of groups of egrets seen on different dates. They were able to say that the smallest group was 3, the largest group was 28, but the average group was round about 12 to 15 birds. They also reported the date when the first birds were seen and when the last were seen, and they made a graph to show the rise and fall of the egret population round their village as far as they could observe.

The point here is that the children learned as much about how to think and how to communicate effectively as they did about egrets and how to observe them.

Mr. Hussein made sure they were well aware of what they had learned about thinking and using numbers.

This, of course, was a good example of our *principle of economy*. But can you see that all the other principles were used too?

Read again the *comment* on page 151 of this section. Can you see how each of the suggested methods helps to promote the attitudes mentioned?

SCIENCE IN PRIMARY SCHOOLS

Why science? We have had nature study in primary schools for many years and it has been only moderately successful. Now throughout the world primary schools are trying to develop science programmes.

The reasons for this are: (1) Modern society needs people who have a more scientific approach to the problems of life, who are interested in science, who have some knowledge of science, who appreciate what men have achieved through science, and who are prepared to support the development of science in their countries. (2) Modern societies need an increasing number of people who are competent in one of the special fields of science, and it is hoped that an interest in science developed in the primary school may lead to more people studying science later on. *What is science?* Science is the modern attempt to understand the world and the universe. Science includes a way of looking at the world and the problems of life—a way of thinking and feeling which is summed up in the phrase 'the scientific attitude'. This attitude is one of interest, first in *what* is happening, second in *how* and *why* it is happening. The scientific attitude includes a belief that whatever we can observe we can study, that events can be understood, that things do not happen in irregular and haphazard ways, but underneath all that happens there is pattern and order.

Science also includes the methods that scientists use in their work. These include careful observation of the facts, and careful checking of ideas or theories by experiment. A scientific theory is just a statement of what scientists believe to be true about something, such as why water comes up a pipe when someone works the pump handle, or how the Sahara desert was formed, or why arrows fall to the ground, or why stars shine at night. First the scientist observes. Then he forms his theory. Then he tries to check it by experiment. Science does not start with experiments. It starts with experience and observation, which raises a question. Next the scientist thinks how to answer the question. Then he makes an experiment to check his answer. (Most primary school science can follow a similar pattern even with little apparatus.)

Science also includes, of course, a large mass of information that is thought to be reliable. (But in science, any 'fact' is open to question. For example, it has been accepted as a fact that the earth is getting smaller. This is now questioned. Some 'facts' turn out to be only theories after all.)

Teaching Science

In primary schools, the object of science teaching is to help children to know, to enjoy and to understand their world, and to develop their ability to think in a scientific, or 'objective', way about whatever events or problems may come before them. Science teaching should not begin and end with 'observations' and with 'experiments', but should result in some awareness by children of the need to gather evidence, of what is meant by a theory, of the need to test theories before believing them, and of what is meant by proof.

Science teaching in primary schools should aim at a steadily developing awareness of underlying principles and an increasing interest in seeing the connections between events.

Obviously the teaching of these intellectual habits must be extended to other subjects, and the success of the teaching will be seen in the way children act and think outside the science periods. When, in all subjects, we find children are becoming more interested in the reasons for things, and more critical about the reasons given; when they are becoming more inclined to compare statements and to check observations; when they are learning to record exactly what they themselves see, regardless of what others may say; and when, in all fields of study, they seem to be ready to think again about their ideas because of new evidence we can be sure they are developing the scientific attitude.

We may therefore include in science teaching not only nature study, but also health, geography and some history, all of which provide many connections with science and each other.

For example, a boy in primary five had a hole in his tooth. The teacher asked him what it felt like. The child said it felt as big as the limestone cave in the hill near the school.

The teacher used that idea by asking how the cave was formed. The children found from an encyclopaedia in the town library that limestone caves are formed by very weak acid dissolving the stone very slowly.

He asked, then, how holes are formed in teeth. They discovered that here, too, an acid was at work.

The teacher let them test lots of things to see if they were acid. They found acid in fruit, milk, fizzy drinks, soil, and rotting leaves. Suddenly a girl said, 'Why don't we all have teeth with holes?' In this way the children went from questions about bad health, to geography, to scientific exploration, and back to health again. They used books to get information. They went to look at the caves. Their questions were not all answered satisfactorily, but that seldom happens in real life, and if science is well taught one thing children must learn is that it is often not possible to get the full answer. Science is still finding out the answers.

Another teacher led straight from science to geography when he showed the children that the air exerts pressure, and he reminded them that the wind presses trees right over. 'But why does the wind blow?' he asked. That question was the subject of a science lesson the following week.

Teachers of younger children should consider what children mean when they ask, 'Why?' They mostly ask 'What?' What is it? What does it do? What colour is it? 'Where?' is a common question, too. Where does it live? Where does it come from?

When ten years old, children may be asking, 'What happens if?' . . . What happens if we touch a lizard's tail?' throw a stone in a fire?, water the seeds?, and so on.

In the first four years of the primary school these are the sort of questions teachers and children should be asking all the time. Children want to know what happens and how it happens. Science at this age should be aimed to answer that sort of question.

In nature study teachers should encourage children to ask questions of these kinds all the time. The questions could very well be written out and put on the nature table, or on a chart on the wall, until they are answered. The children will often provide a statement: 'We have put seeds on some wet blotting paper' or, 'Our chickens hatched out today.' The teacher should encourage the questions: What will happen to the seeds? What do they look like now? What will happen first? What do they feel like now? How did this change happen? How did the chicken get out of the egg shell? What did the chicken do first? What next?

In this way the teacher helps the children to get more experience and more understanding from everyday events, and also to learn to ask more questions, and more useful questions.

The child's first step towards being a scientist is to observe what goes on, to explore and enjoy things. The second step is to begin asking questions that will lead to more insight. But the teacher should not be in a hurry to ask questions beyond the children's intellectual maturity. The most mature kind of question is the 'why' question. And the most mature kind of answer may be a generalisation, as when a big boy asks, 'Why does the stone fly straight from a sling?' and the teacher replies, 'Because of inertia.'

If the teacher then helps the boy to understand the extremely simple idea of inertia, all will be well. But too often the word alone is accepted. The boy may ask 'What is "inertia"?' because it is a new word. But if he asked, 'Why does water come up a drinking straw?' and the teacher replied, using a familiar word, 'By suction', would the boy ask what 'suction' meant?—for it is unlikely he would understand. More probably he would accept the familiar word as if he understood it. But for all the understanding the teacher has given he might as well have said 'By faith'.

The lesson of all this for the teacher is that in general he should follow the principles set out in Chapter 5.

First he provides for *experience and activity*, setting up small situations, such as going for a nature walk, that invite children to explore and observe. From these experiences enough meaning will emerge for the teacher to help the children to form questions. These questions will give *purpose and point* to further work, for example: (1) Which seed pods ripen first? Which will grow longest? How do the seeds come out? How shall we find out? (We will keep a nature diary. We will make a collection. We will measure the ripe pods, etc.) (2) Do these plants grow from roots or cuttings as well as seeds? Do the roots need water?, soil?, sunlight?, darkness? to grow. (3) What do ants eat? Do they eat salt?, sugar?, cassava?, etc., and how shall we find out?

The teacher helps the children to formulate the questions. He helps them set up the situation (experiment) to answer the questions. But he does not provide the answer for any question that a child can answer for himself.

In all this there should be plenty of *individual learning* and plenty of *sharing of learning* in groups. Evaluation, beginning as usual with the setting up of goals—that is, the asking of questions—goes steadily along as a part of the learning, with new questions being asked as plants grow or collections increase, and finally a look back over it all by the class and the teacher to see what they have learned.

It is in these evaluations, at the end of a unit of study, that teachers need to look out for signs that the children, especially those about ten years old, are beginning to ask 'Why?' and to generalise from their observations. When one child says, 'Why do ducks have webbed feet?' and another replies, 'Because all water birds have webbed feet,' the answer may be wrong, but it indicates a mind that can appreciate the idea of a principle.

During the evaluation, too, the teacher must keep in mind the principle of educationally logical order. There are three factors to be considered here:

1. The children's mental maturity. Are the children asking What happens if—e.g. if we put a heavy weight on a growing shoot. If we keep the ants in a closed bottle, etc. Or are they asking: Why? e.g. Why is a plant white when it grows in darkness? Why does an arrow fall? Why does the moon not fall?
2. Are there any connections with work in other subjects, or any similar examples in everyday life that will enlarge understanding of the present scientific study?
3. Are the children showing interests that could lead into another science topic?

In general we may expect children to be more concerned with *What? When? Where?* in the first four years of primary school. In Primary 3 or 4 they add the question 'What happens if?' and in Primary 5 and 6 they are beginning to be interested in *Why?* and to be able to grasp generalisations.

But children do not develop an interest in reasons and principles suddenly. The teacher's skill is to recognise the beginnings of this interest, and to feed it gently until it is strong enough for the discipline of a course of study. When that time comes—and school syllabus makers seem to assume it will come in Primary 5 or 6 for most children—the teacher must be very careful to continue to observe his principles. Science teaching, which aims at understanding, has a long history of arid and anti-educational parrot teaching. Facts and principles are important. There is no understanding without them. But in the main they must, in the primary school, be arrived at by the children. The teacher may guide the children and help them over rough places, but they must themselves walk the path to understanding.

The difference between false and genuine science teaching will appear in this example.

An inspector watched a keen but not very experienced teacher set up an 'experiment', with his class. The teacher wanted the children to learn about 'rusting' or 'oxidisation' of iron. He said: 'I want you all to put a handful of new nails in a jar of water and see what will happen. That is your home work.'

The inspector then asked if he could ask a question. He asked, 'Who knows what will happen?' Every hand went up. They all knew the nails would rust. So the well-intentioned piece of home work was just a waste of time, a waste of nails, and a waste of the experience the children already had. The teacher had asked the wrong question.

The lesson now proceeded this way: 'What happens when a nail rusts?' the inspector asked. The children were uncertain how to answer. 'Do you think something goes into it or does something go out of it?' the inspector asked. All the children thought (as is usual) that something went out of the iron. 'Good,' said the inspector, 'now you are being scientists. You have observed something—that nails rust—and you have made a scientific theory, that this is because something has gone out of them. Now, to be proper scientists you must test the theory. How can you find out? Your home work is to think how we can find out.'

By the next lesson the children had talked it over, and their teacher, warned by the inspector not to tell them everything, had said they should use arithmetic to find out. After a lot of talking he said, 'If a shopkeeper had ten pounds of rice in a sack, and he thought someone had stolen some rice, how could he be sure?' The children soon told him the man could weigh the rice. Then, at last, a girl said, 'Couldn't we weigh the nails too?'

At this point they made their real experiment. They weighed a bottle with nails in it. They filled the bottle with water and let it evaporate. By that time the nails were rusty. They weighed the bottle again. It was heavier. They repeated the experiment twice because they couldn't believe it. Finally they agreed that their theory was wrong. Something must have gone into the iron.

They wrote a letter to tell the inspector. He wrote back: 'You are good scientists. What is the next thing you will try to find out?' They listed places where iron rusted. In water, in the air. They said it must be something out of water, or out of the air, or both. Their teacher then said they had better think what they knew about air. Then a boy said, 'Iron goes rusty in the fire, too.'

At this point the teacher said, 'Perhaps we need to know more about air, fire, and water before we can find out about rusting of iron.'

From this you can see that a false experiment would have led nowhere. But a genuine enquiry into a problem would lead:

1. To the children seeing what the problem was, and beginning to appreciate what clear thinking means and how to go about it. (First get your problem clear.)
2. To some appreciation of the need to think what will answer the question, and the use of measurement in doing this.
3. To a surprising and interesting fact. (Rusted iron is heavier. It is iron plus something else.)
4. To some more questions, requiring much more knowledge.

The question may now arise whether children can find out everything for themselves, and also whether schools can run a good course with no apparatus and no money to buy it. Our answer is that children cannot find out everything for themselves, but by doing a lot of original work they can better appreciate the use of books, and they have a better chance of developing a genuinely scientific attitude. This will be of real value in everyday life to those who leave school, and will be a good start in science for those who go on.

As to apparatus, first let us consider the sort of general idea that we wish children to have when they leave school, and then we may see how much apparatus is needed.

Probably the most important single idea for children to grasp is the idea of inertia: Nothing moves unless something moves it. Nothing stops unless something stops it. Nothing changes direction unless something changes it.

Add to this the idea of gravity—that matter attracts other matter. That the sun and earth and moon are all attracting each other and everything else in the solar system.

Add to this the idea that everything expands with heat, and so gets relatively lighter, and it becomes possible to understand a great many common events. But this understanding should come from observation of what happens and from thinking, 'Why?'

Why does the water go up the drinking straw? You sucked it? Then why does the water go up the pump? Sooner or later the children must come to see that water only moves if something moves it. It is always being moved down by gravity. But what can move it up? Look. What is there to move it up? You can see nothing? Is nothing there?

If the teacher can get no further, he does not tell the answer. His proper course is to go on to other questions of what we may call air science. How does a bird fly? Why does a parachute fall slowly?

When the key facts are at last established, the class can go back to the drinking straw and the pump.

There will not be time to do everything in this thorough way, but if a few questions are answered in this way a proper appreciation of the task and achievement of science will be started.

The teacher should, in the course of this work, focus attention on the processes of science as the inspector did. In this way children do not merely follow a pattern but see sense in the order of their work, and learn to approach questions intelligently. He should also focus attention on the value of science as (a) an intellectual interest, providing occupation for thousands of the most adventurous minds in the world; and as (b) the source of knowledge which more technically minded men, like inventors or garage assistants, rely on for development in their occupations; and as (c) the source of modern improvements in health, food supply, and social amenity of all kinds.

During a science course every child should have the opportunity to observe, theorise, and experiment in his own way. He should also share in the work of his group or class and take part in the evaluation of work.

Usually any science topic will have enough examples for one or two to be kept back for use in tests. For example, anyone wanting to test children's understanding after the study of movement—inertia—pressure, which was suggested above, could do so by asking the children to explain how a siphon works, or why a piece of paper pressed flat on a ceiling will stay there.

THE ARTS

In modern times teachers of drawing, painting and sculpture—the plastic arts—have shown the way to teachers in all subjects. Their great contribution has been to show us all that art in school is not mainly a matter of teaching about art or of teaching how adult artists work: it is a matter of recognising that every child is a creative artist in his own right and of helping him to be as good a little artist as he can be.*

Child art, the whole world now agrees, is simply the use by children of any materials at all to explore and express their own thoughts and feelings about themselves, the people around them, the world they live in, the work they do at school, the stories they hear, and the dreams, fantasies, fears and anxieties that so often occupy their minds.

---

* Similarly the science teacher's main aim is to help each child to be a little scientist, the arithmetic/mathematics teacher tries to make each child a little mathematician, and the language teacher to help each to be a speaker, a poet and a critic—a performer, not just one who has learned what others think and do.

When the material the children use permits expression through colour, line, texture or shape, the activity is called art, or art and craft.

When the material the children use is their own bodies and their own power of movement, the activity is called 'creative movement'. Creative movement includes mime and dance and, when the children speak as they move, child drama. But there are no clear boundaries between these four. Any one of them may include the others. When the material the children use is sound, using pitch and tone and rhythm, but not words, the activity is called 'music making' or 'child music'.

We should remember that there are similar child arts inside language, such as child poetry, and that in a particular piece of expression two or three arts may have a place—as when a child sings his own words.

The first purpose of art in education is to allow children to live a full and satisfying life now, by satisfying their basic need to understand and control their world, their need to be intellectually creative and adventurous by thinking and expressing their own thoughts in their own ways, and their need to share in social life by communicating in many ways with other children.

The second purpose of art in education is to help children to become more aware of their world, more sensitive to other people, more at one within themselves, so that they will be able to enjoy life more.

The third purpose of art in education is to help children to develop their powers to think, and to express themselves clearly, fully and effectively. There may be other aims for art in education, but we may sum them all up in the words 'to have life, and to have it more abundantly'.

The teacher's part is first to provide the relaxed and friendly classroom atmosphere in which children know that they and their work will be treated with respect, and in which a variety of standards of work and ways of expression will be accepted. Next he must provide the stimulation of suggestions and materials that will set children off on artistic expression. Then he must watch the children to see what their next step in development should be. Finally, by asking the children about their work he will help them to see where their expression is not adequate and where it is complete, so that they build their own standards as they go along.

The teacher's guidance should nearly always be indirect, through questions that will cause children to look and listen and think about their work, and solve their own artistic problems. Direct instruction has little place in child art. It is often right to set a subject or to tell a child what to do, but seldom right to tell him how to do it. In art there are usually many ways to do, that is, to express something. Children should find their own ways, not learn to copy adult ways or to assume that some particular adult way is right. But as child art moves towards adult art, in the early years of adolescence, there is more justification for direct teaching. We see this clearly in traditional arts and crafts and when the pupils are taught how to sing a song, or do certain dance steps, or make a basket or set up a loom for weaving. But in all these cases the children are in the position of a man who has to paint someone else's picture. By doing this he may learn a technique and he may enjoy the picture, but if he also learns that this is how pictures ought to be painted he will find it harder, in future, to express his own thoughts in his own way. He will be more of a parrot and less of a man. This danger grows less as children grow older, but it is always present during the school years.

Let us now see how the principles of teaching appear in the development of these arts.

Mime and Movement

First we remember that the children begin always with activity and experience on one side, and with purpose on the other. The children need to have experience of materials before they know what they can do with them, and in schools the teacher needs to supply a purpose which will send the children searching for materials, to test and to try. So the teacher takes a subject—any subject that crops up.

We may take for example a story about animals: the race between the hare and the tortoise. First we act it. In child drama everybody acts; there is no audience.

Here is how a good teacher might start his lesson on the race between the hare and the tortoise.

Teacher: How does the tortoise move?
Children: Very slowly!
Teacher: Show me. (The class become tortoises on the grass. Some are much slower than others.) John is a good tortoise. Watch him. Now all be tortoises again.

This time the children have learned to be slower. But the teacher watches and encourages them until they have a much clearer idea of what a really slow movement is.

Then he introduces a contrasting quick movement. 'Now we will be hares. All be hares on the starting line. How many legs has a hare? Do you remember how a hare runs? Remember what the hare did when it passed the tortoise! Ready? Go!'

Some children simply run, some crawl, some jump along. Some are better hares. They remember how the hare looked back and could not see the tortoise. They mime this, and they mime the hare going to sleep.

The teacher, watching, sees some who did it very well. 'Peter, show us how the hare looked back. Now, Olu, you show us. Now, Hannah, you show us. Now everybody, look back, and then go to sleep.'

After this the children mime the other animals, watching and cheering. The teacher tells them to be lions, then snakes, then giraffes, then vultures.

Later they may take parts. One boy is the tortoise, another is the hare, the rest are animals. They mime the whole story.

In this piece of creative movement or mime the children have already begun to learn to control their movements in order to express the slowness of the tortoise, the speed and the vanity of the hare, the pride of the lions, and the different characters of other animals.

You can see that they began with a rather vague *purpose*. But as they gained experience they found how they could use movements. More meaning emerged from their activity and they became more aware of themselves and more interested in how animals move. Their purpose became clearer and more concrete. While each child did his miming in his own *individual way*, the whole class *shared the experience* and they learned from each other how to move so as to express their ideas more effectively.

The principle of *educationally logical order* had to be observed by the teacher himself when he decided what came next. At the next story and drama lesson, he might decide to tell the whole story again with much more detailed description of the animals' behaviour, and then let the children act it again. Or he might think the children need to learn to change from slow to fast, or from snake to lion, more definitely. He then must think of some way of letting the children practise these actions *during physical education*.* When the children mime the race again he will observe their progress and he may decide to discuss it with them. This, of course, would be the *evaluation* of the work.

At a later stage, this lesson in movement and mime might be used as a part of the English course, with the animals saying in English what they are doing. At this stage the children may be divided into groups, with a few tortoises, a few hares, and many spectators to call out remarks to the racers. Some teachers might even make one child a radio announcer to report the race. This could only be done if the child spoke English very well.

Obviously this simple story could be used and developed in several ways. Whatever the teacher does, however, he must be guided by his observation of the children. At each lesson he must ask himself what the children need to develop next, and he must ask himself what activities and what questions will help the children to achieve the aims of art in education.

If, for example, his children move heavily, are noisy, and run into each other, he may make up a little story about bats. He will ask a few questions about bats. 'Do they fly fast? Do they make noises? What sort of noises? Do they ever touch anything? Do they fly straight—or how do they fly?'

---

* Here is another example of what we may call the *principle of educational economy*. This means that the teacher must use school time in a sensible and economical way, so that one subject supports another. The programme and methods of a subject like physical education, for example, are varied to support the general work of the school. But physical education itself is not neglected.

Then the children can be bats, swooping with little squeaky cries, never touching, flying away from the light and to a dark home when the sun begins to come up. 'How shall we act the sun?' The teacher *never* shows the children how they should act. They tell him and they show him. He may set the problem: act like bats; act like the sun; and so on. But the children provide the answers. He does not show them because he does not want them to imitate his adult ideas. He wants them to develop their own ideas. The teacher should usually accept what the children do, and he should accept, for a trial at least, their suggestions.*

Music

Our teacher intends to introduce child music to his school. How does he go about it? He might begin with the story of the hare and the tortoise like this:

'You all know the story of the hare and the tortoise. We have mimed it several times. Today it is raining so we cannot go out to mime. Let us do it in sound. First let us see what sounds we can make? Everyone try. No voices. Just use your hands on the desks and chairs.

'Now let us see how many different sounds we have found. You can each make one in turn as I point to you.'

The children will produce many different sounds by tapping, banging, slapping or rubbing with nails, fingertips, knuckles, palms, fists, quickly or slowly, hard or soft, and on different parts of the desk.

Then they can be asked to work in groups to produce sounds that will be the gabbling of all the animals at the start; the starter's signal; the hare and the tortoise racing—one fast, one slow; the hare turning round, lying down, going to sleep, the tortoise plodding on; the hare waking with a start—and so on.

Once a class has done that sort of activity once or twice, groups can be asked to prepare their own music for a story or an incident:

---

* Teachers who wish to follow up the teaching of mime and movement will get much help from the book *Teaching Mime* by Rose Bruford (Methuen).

The god of thunder visits a village.
The Harmattan stops.
The Rains begin.

Music for mimes may be developed too, and if the children produce some interesting music for subjects like those above, why not a dance to fit the music?

In Africa there is a vast range of traditional instruments, many of them very cheap to buy. These, and not expensive big drums, are the things for school music. But it is not necessary to have recognised instruments at all. Anything that will produce a sound can be used: wood (soft or resonant), pots, tins, calabashes, bamboo tubes, stones, seeds in rattles, and old bicycle bars and pipes cut to different lengths.

The children (as part of science) may try to discover what makes high or low notes. Lengths of bamboo, and bottles filled to different heights with water, will help here. When they know this, and have got a few long bamboos or pieces of wood to make booming noises, they should be encouraged to explore the uses of these. If they have already a small piece of music, would the booming notes sound well at some point? Or if they start with a few booming notes, how could they go on? They can try soft and loud booms, different rhythms of booms, booms followed by high squeaky sounds, or rattles, or scratchy sounds.

The teacher's first task is to get the children to explore sounds and find out what is possible. As they do this they will begin to use the sounds to express themselves. When they make their music the teacher must ask again, 'Is that exactly the sound, exactly the feeling, you wanted?' He must, by asking questions, get the children to listen carefully to their music and to decide whether it is satisfactory. In this way he helps them to build their standards and avoids imposing his own standards.

Teachers of small children, especially those teachers who are parents, know that before they come to school many children often sing their own songs to their own words. This natural music making should be encouraged in schools with 'That is a nice song you are singing, Mary. Will you sing it again for me?' 'Listen to Timothy's song.' 'Has anyone else a song today?'

Once these young and unselfconscious children have begun to sing their own songs at school it is easy to keep this kind of activity going as the children move up the school.

Another step is for other children to join in, so that there is group and class singing. Then there will come ideas for adding very simple music from instruments.

In one class at drawing time a little boy was singing softly 'Aeroplanes coming. Aeroplanes coming.' Again and again. His teacher listened till she had learned his little tune. At singing time, she said, 'Would you like to hear Abu's aeroplane song? Tell me if I sing it right, Abu. I liked it so much I wanted to learn it.' Then she sang it softly the way Abu sang it. The other children began to sing it. Then they added more words:

Aeroplanes Coming;
Aeroplanes Coming;
Far away, far away;
Aeroplanes Coming;
Aeroplanes Coming;
Nearer, Nearer;
Big planes coming;
Big planes coming.

As they sang the new words they sang louder, and they changed the notes. Then they began to add some drum notes between lines. They often sang their aeroplane song, and nearly every week they put in something different.

Sometimes they finished with 'Landing—bump.' Sometimes with 'Off again, off again (very loud)' and 'Going away, going away', so quietly that you could hardly hear them.

That song gave the children a lot of experience with sounds and they used it for other songs.

One of the main reasons why child music has not been developed very far in European schools is the fact that so much European music is written down and so many European teachers think of music as reading the music of great composers. Now teachers are beginning to see that it is children's own music that comes first. When children learn a new language, they learn to speak their thoughts and hear other people's thoughts spoken long before they learn to read and write. So it should be with music.

There are many different ways in which children's natural music may be developed and this is a field in which, along with creative movement and dance, African schools have no disadvantage of materials and could, with a little effort, lead the world.

Art and Craft

The two main difficulties in the way of a lively art and craft programme in African schools are to be found in the minds of teachers. (1) They believe that art in schools is drawing or painting with pencil, crayon or paint on sheets of white paper, each child working alone. (2) They believe that craft is mainly an introduction to useful adult crafts such as basket making, weaving, or making brooms for sweeping. There is something to be said for both these points of view—something—but not much. Children's art is not to be a copy of adult art. It is to be expression by children of children's interests, using whatever materials are available, and carried on according to the imaginative ideas of children.

This means that teachers must have flexible minds and be prepared to accept as art and craft many ideas and activities that are far removed from making little drawings in books or making useful articles like brooms with palm and raffia. Here are some examples of modern art teaching in African schools:

1. The Primary 3 teacher heard a child telling about witches. He said, 'Who knows what a witch looks like? Who can make a witch face? Let us all make witch faces for ourselves. Then we can have a witch dance. What shall we use? Go outside and see what you can find.'

The children found big leaves, sticks, raffia and other fibres. They cut holes in the leaves for mouths and eyes. They used raffia to tie the leaf faces on. They used the fibres for hair and whiskers.

They put the faces on and made a dance. Playing witches became a favourite game and they invented many new kinds of faces. Some had pieces of stick or bark for a mouth and eyes.

The older children in the school made faces too, but they used big pieces of bark. Some used pieces of soft wood and some used paper and cardboard from old cartons. This face making went on for several weeks, and if you think it over you will see all our principles at work in it.

The children had a purpose, they explored their world for materials and found what they could do with them. They learned how to use line and form, and texture and colour, in making witch faces. They became more imaginative and original in their use of all sorts of materials.

2. The teacher in Primary 5 said, 'Christmas is coming. Let us make animal toys for the children in Primary 1 and 2. What shall we use? We will go out and see what we can find.' The school was near a river. They found many strange roots and bits of wood along the river. They brought them to school and looked at them. Soon a boy said, 'That bit is like a lizard. I can paint an eye on it.' Soon many other children could see that these roots were a bit like some animal. They cut and painted the roots to make them more like animals.

When some children could not find suitable roots the teacher said, 'Never mind. Let us use some fibres.' They collected lots of fibres and tied them into shapes. Then they began to tie bunches of fibres onto sticks. They made knots of black fibres and pulled them through balls of pale fibres to make eyes in a head.

Before long they invented new animals no one had ever seen. The little children enjoyed their toys when Christmas came.

3. A Primary 6 teacher said, 'We have been talking about the people of Egypt. They used to paint on the walls of temples. I am sick of your little drawings, and I am sick of our dirty walls. Why shouldn't we paint on our walls?'

The children had nothing to paint with, but the teacher said they would have to think. They tried painting with yellow clay in water, but it dried and cracked and fell off.

They scrubbed the walls and put on yellow lime wash. Then they tried whitewash with some dyes from the market. Another time they pasted on some pieces of coloured paper they cut out from old magazines. They made a picture of the first men in their village before there were any houses or animals. That was at the end of the year. Next year the new Primary 6 covered it all with whitewash again and made their own paintings. The class worked in groups and everyone shared in painting their walls. They made new wall paintings every term. They learned a lot about materials and they thought a lot about their painting.

4. From the Japanese we may take this valuable idea for aesthetic appreciation. In every Japanese home there is one place where something interesting or beautiful is always displayed. This is called the *tokonoma*. Often there is one flower or a pot of flowers, sometimes a beautiful basket, or a stone, or some interesting seeds, or a fruit, or a picture, or a piece of driftwood, or a piece of old iron worn by the sea, or some seeds, or a little carving, or a beautiful insect, or a piece of cloth. Each week the tokonoma is differently arranged, and it is a great honour to be asked to arrange the tokonoma for the week.

In schools this idea can be used to concentrate attention on one or two things. The teacher might set aside one little piece of board, or a chair in a corner, and ask a child to arrange on it one stone and one flower. Then the teacher will look at it and like it. Perhaps, on the first occasion, the teacher may ask some other children to arrange the same things differently so that they learn that there are many ways of arranging two or three simple things. In doing this the children look more closely at the simple things they handle and they may learn to enjoy what was previously not noticed.

The children may arrange the class tokonoma after that, and because there is no need to have expensive things every child should be able to find something. Thus every week there should be something new to look at. Gradually children will see interest and beauty in the curve of a grass stem or the bare lines of a thorn, or the texture of a clay pot, or even a lump of clay.

But it is no use having a tokonoma unless the teacher takes an interest in it. It must not be allowed to become just another place for dust to collect.

The tokonoma idea could, of course, be combined with the nature table or science table idea, but if the class is lively there will be room and use for both.

Note on materials

1. The same materials may be used for different purposes at every level in the school.
2. Traditional materials of adult crafts should be used for non-traditional purposes and non-utilitarian purposes.
3. All children should have some choice of materials each year.
4. Every child should have an opportunity to work in the round, e.g. with clay, soft stone, wood, or fibres, and in the flat, e.g. by drawing or painting on paper or walls, or by sewing or printing patterns on cloth, or weaving.
5. Every part of Africa has some materials that can be used for art. Of these probably the most common are also the most useful in art. These are clay and fibres. Fibres include coconut husk fibre, cotton, grasses, raffia, hemp, jute, sisal, and light canes, bamboos and sticks.

They may be used for work in the flat, as in weaving, sewing and collage; or for work in the round as when used in bunches or knots to make animals, or woven in basket fashion to make shapes of various kinds.

Some useful books on the teaching of art in primary schools are:

Ruth Mock, *Principles of Art Teaching* (O.U.P.)
Victor Lowenfeld, *Creative and Mental Growth* (Macmillan, New York).

A useful small book on the whole idea of the arts in Education is:

A. R. Stone, *The Story of a School* (H.M.S.O.

A Final Word

If, as a student, you have read this book and thought about the educational principles and suggestions for practice put forward in it, you will find yourself either mainly sympathetic towards them, or not.

If you are not sympathetic, you have no special problem. You will face your class and get into difficulties as all young teachers do, but plenty of older colleagues will give you advice that you can accept. In a few years you will be an older teacher handing on advice to others. But if you are sympathetic towards these ideas you are likely to have the special problems that face all pioneers who are not supported by the experience of the old-timers round about, and who are trying to do something their colleagues do not always understand or value.

One of these problems is that though the aims are clear enough, the details of method have not been, and cannot be, reduced to a routine. You have to keep thinking and experimenting all the time, and for a long while you will not know what the class should look like, or how you will feel while working in the new way. You will have to feel your way along, think your way through the day-to-day problems and look back over your work carefully to see what went well, what went badly, and why.

This means that you can expect more disappointments and less help in your first years of teaching than if you followed a more traditional way. But as you learn to manage children and develop school subject matter, you will get more satisfaction out of your work, and you are more likely to become a leader in your profession.

Another problem is how much new-style work you should attempt in your particular circumstances. You can never throw over your principles, but you must consider how, and how far, you as a junior member of a team can work differently from others. What, you must ask yourself, can your principles mean in practice in each situation. In most schools the headmaster will be pleased to see your ideas developed in some subjects, but will be doubtful about others. If you can achieve success in some subjects, he will be more willing to see you extend your ideas to others.

Then there is the question of equipment. Some schools have so few books, so little material to work with, that the teachers may think that new, active, creative methods can not be used. It is true that materials, apparatus, and special books are a help, and are essential for some special techniques, but much can be done even in a desert. The children, though naked, can speak and sing, they have bodies to use for movement, dance and drama, and the earth on which they stand can be used to model with.

It is not what equipment we have, but how we use it that makes the difference between parrot learning and intelligent activity, between sterile instruction and creative education. Many classes in well-equipped schools get a dull and poor education simply because they are not allowed to talk, to think, and to move.

During the first years when you are learning to manage children and organise their work, you will have the problem of dealing with the advice of competent traditional teachers. Do you listen? Do you accept advice to 'throw away all that theoretical college stuff and get on with practical teaching'? Do you accept advice to use repressive methods 'in the meantime' until you have learned to control the class?

We advise you always to listen. You have much to learn from experienced teachers and often they are half-way towards your own point of view. But do not throw away theory. To throw away theory is to throw away thinking about your work. What you have to do is to think, more carefully than ever, 'If my ideas are right, why do I fail?' You must try to observe your practice and diagnose your trouble as if you were a doctor—find what is wrong, and try to correct it. This may take a long while, but to stop thinking will not help, and going back to old ways 'in the meantime' will not help either. To do that is simply to form bad habits. There is no reason to think that doing the wrong thing for a few years will lead to doing the right thing successfully later on.

In teaching we should do the right things for the right reasons in the right ways. If we don't succeed we must keep on trying as intelligently as we can, until we develop the skill to handle our methods effectively. If we do not risk trying, we will never change and never improve.

All young teachers have difficulties, whatever their methods, and you will be no different. But in a year or two you will gain control of your subject matter, you will be more familiar with children, you will be older and more sure of yourself, and you will find that you can do easily what once seemed almost impossible.

S.C.E.R.T., West Bengal
Library
Calcutta
25/3, B. C.

370·1
CHA

85